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1936 • 1937

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IRON AND STEEL ENGINEER

VOL. XIV OCTOBER • 1937 NO. X

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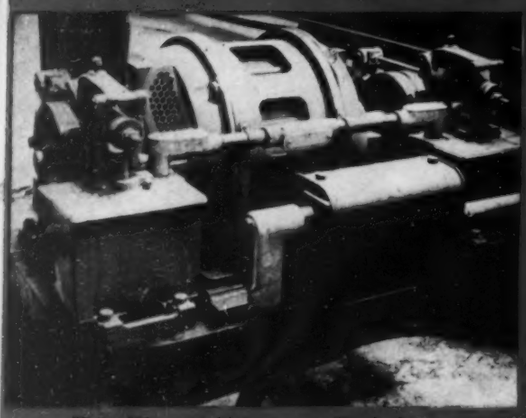
Published Monthly by

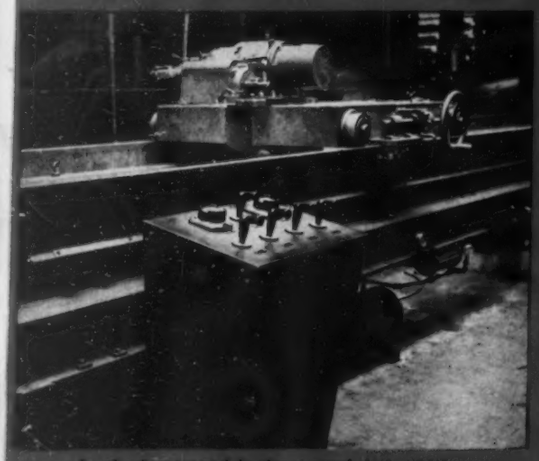
ASSOCIATION OF IRON AND STEEL ENGINEERS

Entered as second-class matter January 25th, 1924, at Pittsburgh, Pa., under the Act of March 3rd, 1879. Single Copy $1.00
Subscription price in U. S. & Canada ..... $5.00 per year
Subscription price in foreign countries ..... $7.50 per year

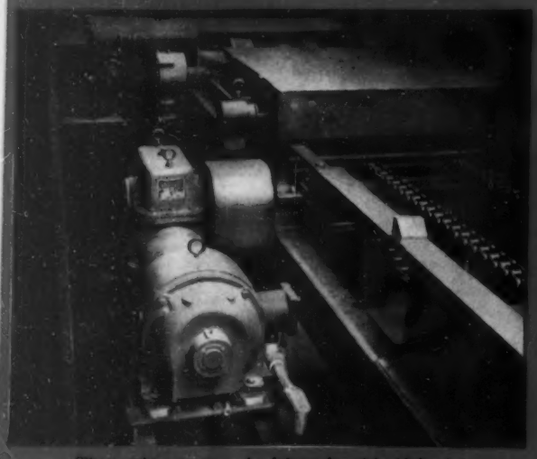
PLASTIC BINDING U. S. PATENT NO. 1970285 LICENSE NO. 10



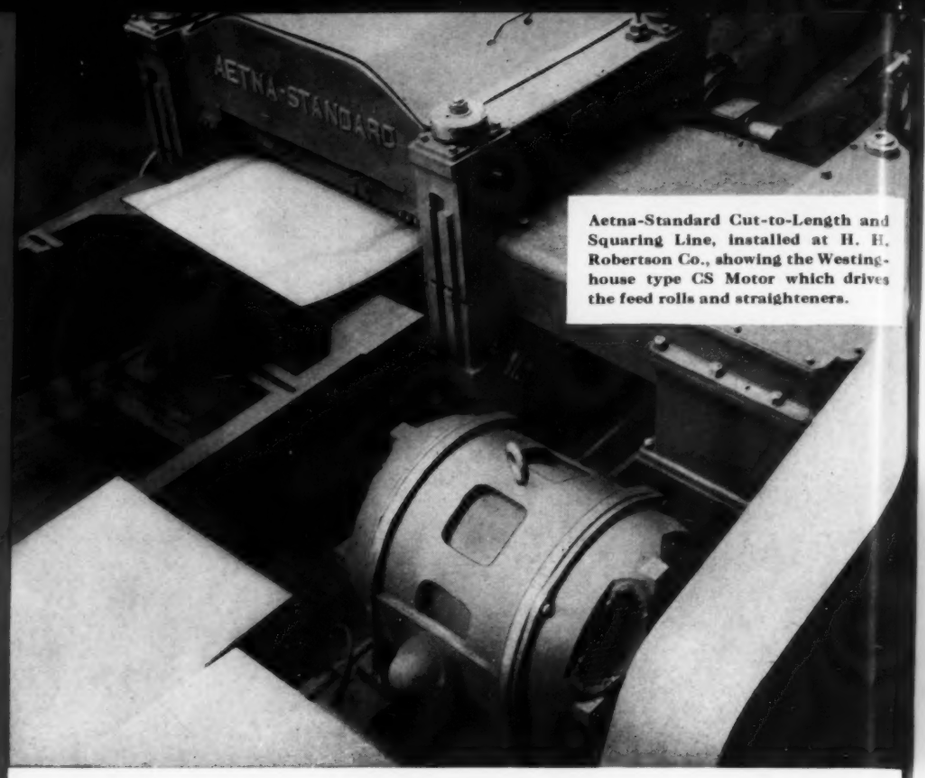
This 520-rpm. high-torque Westinghouse type CS motor drives the shear. Type AI Westinghouse magnetic brakes stop the motor immediately after the cut.



In the foreground is the control desk which gives the operator finger-tip control of all operations. Beyond is the ½-hp. Westinghouse Gearmotor that lifts the gauge after the sheet has been sheared.



The main conveyor is driven by this 10-hp., 1160-rpm. Westinghouse Splash-proof Motor.



Aetna-Standard Cut-to-Length and Squaring Line, installed at H. H. Robertson Co., showing the Westinghouse type CS Motor which drives the feed rolls and straighteners.

SHEETS FROM COILS 300 TO 400% FASTER

BY NEW AETNA-STANDARD MACHINE EQUIPPED WITH WESTINGHOUSE MOTORS AND CONTROL

A new Aetna-Standard cut-to-length and squaring line recently installed in the Ambridge Plant of the H. H. Robertson Company is setting new records in automatically producing flat and square sheets direct from a coil.

Powered throughout with Westinghouse type CS (A-C.) motors, this machine not only increases production speed, but eliminates most of the scrap which resulted formerly when standard 24-foot sheets were used.

It can cut as high as 20 tons of sheet per hour from roll strip up to 37 inches wide. With a maximum speed of 200 feet per minute, it cuts sheets as long as 24 feet with an accuracy of ± 1/32 of an inch.

Westinghouse engineers have worked closely with machinery manufacturers in the development of equipment such as this new Aetna-Standard machine. To assure maximum benefits in efficient low-cost operation, specify motors, control, circuit breakers, and auxiliaries by Westinghouse. J 93253

Westinghouse Electric & Mfg. Co.,
East Pittsburgh. Pa.

UNDIVIDED RESPONSIBILITY MULTIPLIES THE VALUE of WESTINGHOUSE SERVICE

W WESTINGHOUSE ELECTRIC

FROM POWER SUPPLY TO DRIVEN MACHINE

Specify Westinghouse

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English Electric Co., Ltd.
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PAUL C. HALLAM,
President,
Allied Engineers, Inc.
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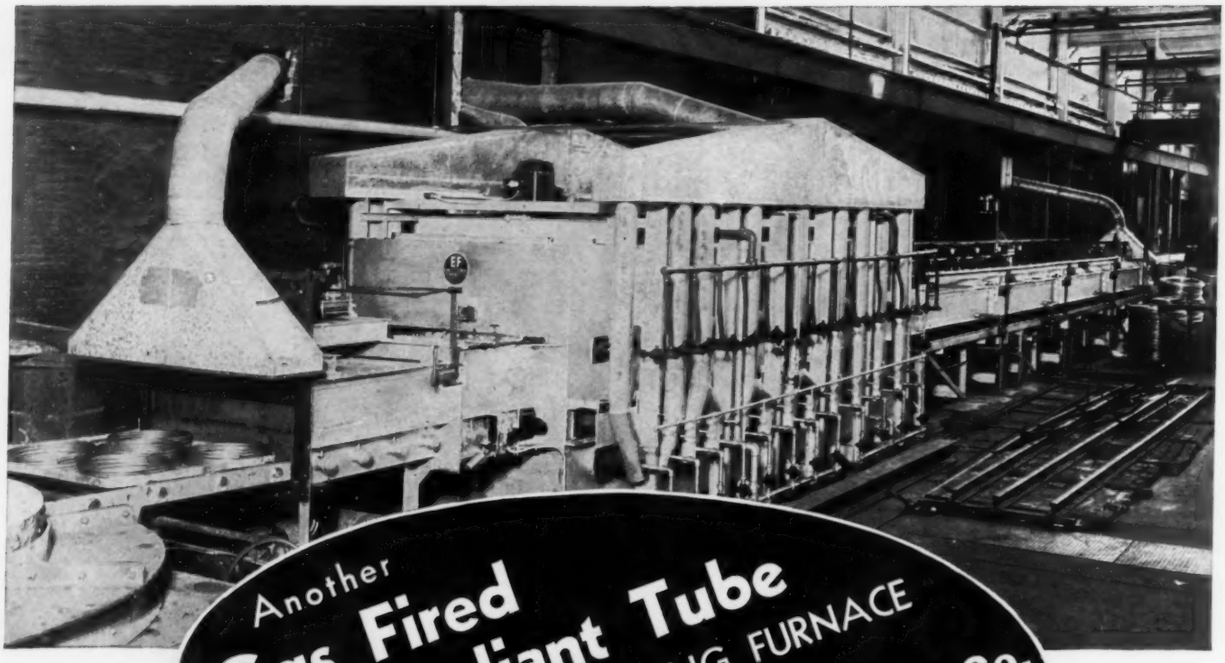

Another
Gas Fired Radiant Tube
BRIGHT ANNEALING FURNACE
Designed and Built by
The Electric Furnace Co.
Salem, Ohio

The above continuous special atmosphere bright annealing furnace—one of several recently placed in operation—is equipped with The Electric Furnace Company's new Gas Fired

Recuperative Type Radiant Tubes

SAVES FUEL—This recuperative principle—exclusive with The Electric Furnace Co. radiant tubes—utilizes waste gases to preheat the incoming combustion air before it enters the combustion chamber—thus requiring less fuel and making it the most economically operated radiant tube yet developed. The products of combustion leave the furnace at very low temperature—there is practically no waste heat.

MORE UNIFORM TEMPERATURE—By admitting the necessary combustion air throughout the entire length of the burning chamber and thereby providing positive mixture of air and gas just where it is needed for perfect combustion, this provides an even temperature over the entire length of the tube, thus making it possible to maintain uniform temperature throughout the entire furnace chamber.

MORE CONVENIENT—These tubes are easy to adjust, install or to remove for maintenance—in fact, can be removed and replaced while the furnace is in operation.

INVESTIGATE the economy, uniformity, convenience and other advantages of The Electric Furnace Co's new gas fired—recuperative type radiant tube for your next fuel fired furnace installation or for modernizing your present furnace equipment.

Consult with us on any of your heating or heat treating problems. We specialize on building furnaces to fit the customer's specific requirements—for any process, product or production—either electrically heated or fuel fired, whichever best suits the particular plant, process, or problem—we solicit your furnace inquiries.

THE ELECTRIC FURNACE CO.
SALEM, OHIO.

Electric and Fuel Fired Furnaces

Furnaces Built to Your Requirements

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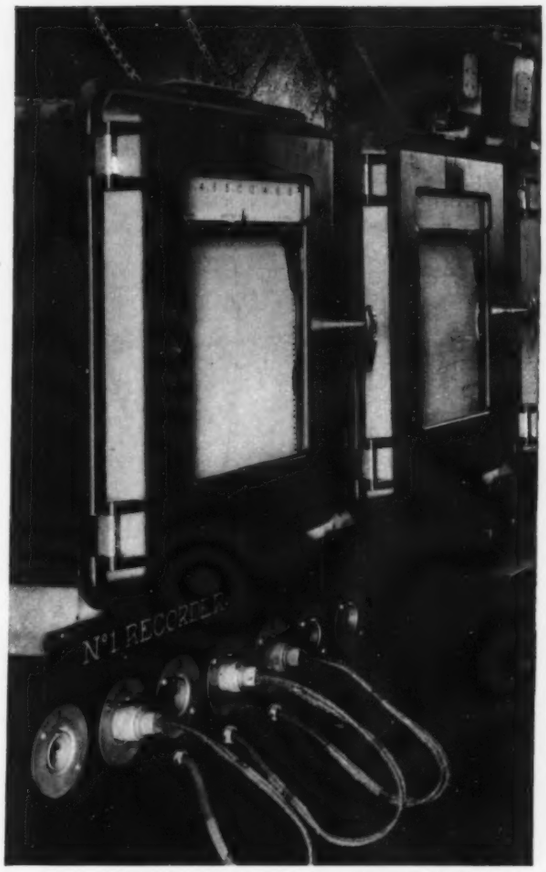

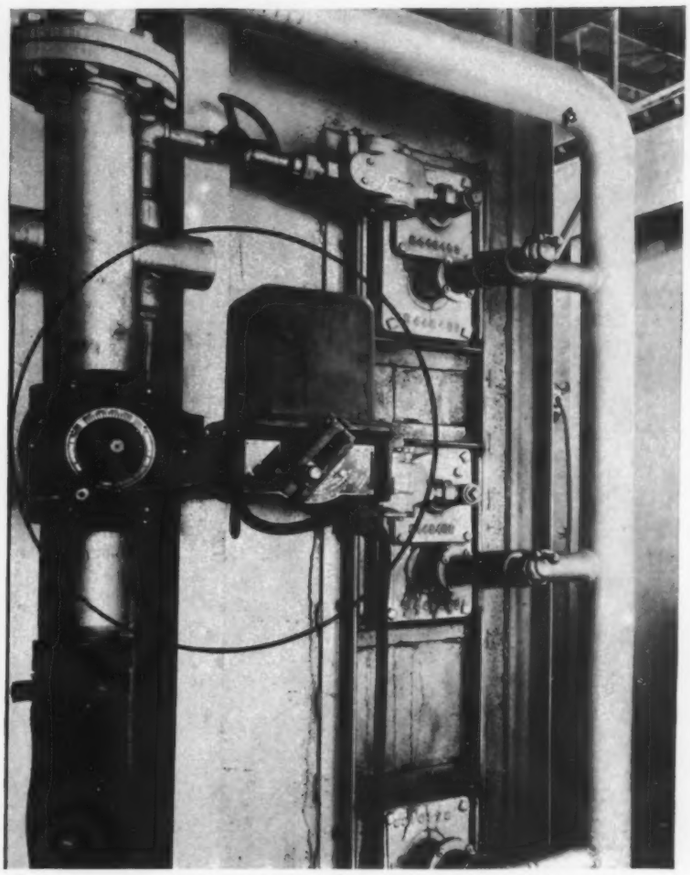

Two principal units of Micromax Electric Control—At left, Micromax Controllers, with plugs for switching thermocouples to any desired furnace. At right, Drive Unit on a cover-furnace gas valve.

FOR *Any* FURNACE...

MICROMAX ELECTRIC CONTROL

With component parts exactly matching the Micromax Pyrometer in sensitivity and dependability, Micromax Electric Control makes available from couple to valve drive all the qualities that Micromax users associate with that Recorder. And—this Control fits any furnace, from blast furnace to small box-type unit. It can be standard for an entire plant—bringing big-furnace dependability to the regulation of small furnaces, and small-furnace simplicity to the big units.

LEEDS & NORTHRUP COMPANY, 4942 STENTON AVE., PHILA., PA.

LEEDS & NORTHRUP

MEASURING INSTRUMENTS · TELEMETERS · AUTOMATIC CONTROLS · HEAT-TREATING FURNACES

JNA(5)

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Be Modern . . . Put Your OVERHEAD LIGHTING *On Wheels*

with BULL DOG UNIVERSAL TYPE

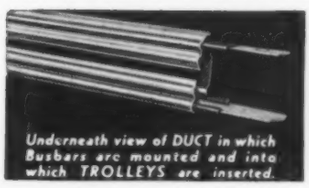
Trol-E-Duct

Why tolerate the LIMITATIONS and EXPENSE of a FIXED Lighting System? Why not have a modern FLEXIBLE Lighting System which permits you to instantly change the position or increase the number of your present Lighting units to meet changing working level requirements? Universal Trol-E-Duct—the System of Lights on Wheels—is just such a Flexible Lighting System. Every inch of it is a potential source of current for inserting additional or different Lighting units which, if desired, may then be moved in either direction along the Duct run.

Write For Illustrated Bulletin

Lighting Fixture attached to a TROLLEY which acts as both feeder and movable means.

Above photograph shows part of a complete factory overhead lighting system of Bull Dog Universal Trol-E-Duct.



Underneath view of DUCT in which Busbars are mounted and into which TROLLEYS are inserted.

Cross Sectional View, Showing Rolling TROLLEY Inserted In DUCT.

BULL DOG ELECTRIC PRODUCTS COMPANY

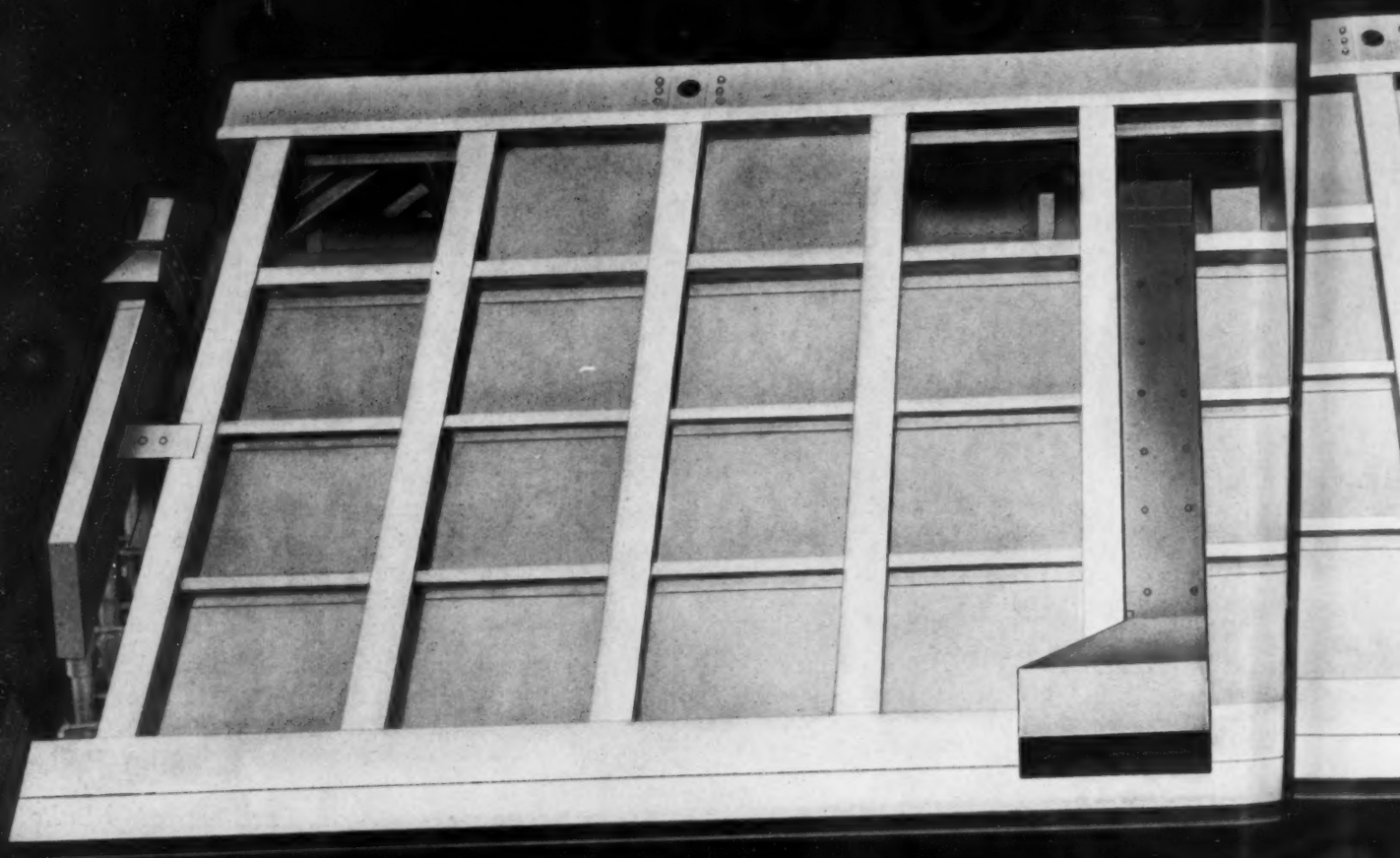
Pioneers of Flexible Electrical Distribution Systems

DETROIT, MICHIGAN

BULL DOG ELECTRIC PRODUCTS OF CANADA, LTD., TORONTO, ONT.

LOOK INTO MODERN SHEET AND STRIP **ANNEALING** PROF

PRODUCED BY SC HORIZONTAL RADIANT TUBE HEATIN COVE



PROFITS

COVERS

● You can readily figure the difference between older methods of sheet and strip annealing and this modern way—the SC fuel-fired *horizontal radiant tube* annealing cover. Costs differ fundamentally—for whereas it was former practice to remove the charge from the furnace—it is now possible to remove the furnace from the charge . . . with scarcely a pause in production!

Look at the interior of the SC annealing cover shown above while it is suspended from the crane which is transferring it from a charge just annealed to a cold charge awaiting the heat. Sturdily built of steel plate, heavily reinforced, lined with the correct refractory, the interior shows the SC *horizontal radiant tube* heating elements along the sidewalls. Cast of chrome-nickel-iron, these heating elements become incandescent in use, providing a uniform, easily controlled temperature top to bottom, end to end of the charge. The patented floating tube construction prevents distortion or stress in tubes due to expansion under heat, avoiding costly maintenance.

As soon as the heating cover has finished the soaking period, it is removed and the work allowed to cool within the inner cover, filled with a controlled atmosphere provided by a DX gas preparation machine. The heating cover may be applied at once to a cold charge, and the annealing cycle resumed.

Experience of mills is the same—SC annealing covers provide the highest quality of work at the lowest cost per ton annealed. Ask an SC engineer to call—and send for the booklet, "MODERN ANNEALING PRACTICE" which shows types of SC annealing covers available.

SURFACE COMBUSTION CORPORATION, Toledo, Ohio

SURFACE COMBUSTION

Builders of ONE WAY FIRED SOAKING PITS, BILLET HEATERS, PACK OR PAIR ANNEALING, CONTROLLED ATMOSPHERE FURNACES, NORMALIZERS

A. I. & S. E.

DISTRICTH

T. E. HUGHES, chief maintenance engineer, Carnegie-Illinois Steel Corporation, Duquesne, Pennsylvania, is the Chairman of the Pittsburgh District, for the year 1937-1938. Mr. Hughes entire business background has been one associated with the steel industry. Mr. Hughes started to work with the Union Railroad in 1902, and successively worked at the Clairton Plant of the Carnegie-Illinois Steel Corporation, McKeesport Plant of the National Tube Company, Youngstown Plant of the Youngstown Sheet and Tube Company, and for the past 25 years has been at the Duquesne Plant of the Carnegie-Illinois Steel Corporation. Mr. Hughes attended the public schools of Duquesne, and the night classes of the Carnegie Institute of Technology.

T. E. HUGHES
Chief Maintenance Engineer, Carnegie Illinois Steel Corp., Duquesne, Penna.

T. J. ESS, Chairman of the Cleveland Section for 1937-1938, is combustion engineer, Republic Steel Corporation, Massillon, Ohio. Mr. Ess was graduated from the Carnegie Institute of Technology in 1922, receiving the degree of mechanical engineer. His first steel mill affiliation was with the Central Steel Company, Massillon, Ohio, where he spent several years in the maintenance department, later being made the assistant steam engineer. Since the merger of the United Alloy Steel Corporation to form the Central Alloy Steel Corporation, the later Republic Steel Corporation, Mr. Ess has been the combustion engineer at the Massillon Plant.

T. J. ESS
Combustion Engineer, Republic Steel Corp., Massillon, Ohio.

H. W. NEBLETT, Chairman of the Chicago Section for the year 1937-1938, is associated with the engineering department of the Inland Steel Company, Indiana Harbor, Indiana, and is particularly concerned with power plant work and the development of new steel mill equipment.

Mr. Neblett's steel mill experience began with the Mark Manufacturing Company at Indiana Harbor, Indiana in 1916. Later the name was changed to the Steel & Tube Company of America, the plant now being owned by the Youngstown Sheet and Tube Company. He was located with this plant from 1916 to 1920 as assistant electrical engineer, and from 1920 to 1922, he was electrical engineer at the Chicago office of the Steel & Tube Company of America. From 1922 to 1928 he was with the Colorado Fuel and Iron Company as engineer in charge of electrification of steel plants including power plants, the electrification of the existing mills and new mills that were constructed during that period. From 1928 to 1932 he was head of the Neblett Engineering Company in Chicago, a consulting engineering corporation dealing with the design and installation of steel mill equipment. In 1932 he went with the Inland Inland Steel Company, Indiana Harbor, Indiana and assumed the duties of the position he now holds.

CHAIRMEN

1937-1938

GEORGE O. VAN ARTSDALEN, Chairman of the Philadelphia Section for the year 1937-1938, is superintendent of maintenance department, Henry Disston & Sons, Inc., Philadelphia, Pennsylvania. Mr. Nan Artsdalen was educated in Philadelphia public schools and extension schools.

From 1912 to 1917 he was affiliated with electrical contracting and maintenance work in the Philadelphia area. During the World War, he was a chief electrician in the United States Navy. Following the conclusion of the war, and during the year of 1919, he was supervisor of electrical wiring and installation, William Cramp Sons Ship and Engine Building Company. Since 1919, Mr. Van Artsdalen has been with Henry Disston & Sons, Inc., first as chief electrician, from 1930 to 1936, and since that time, superintendent of the maintenance department.

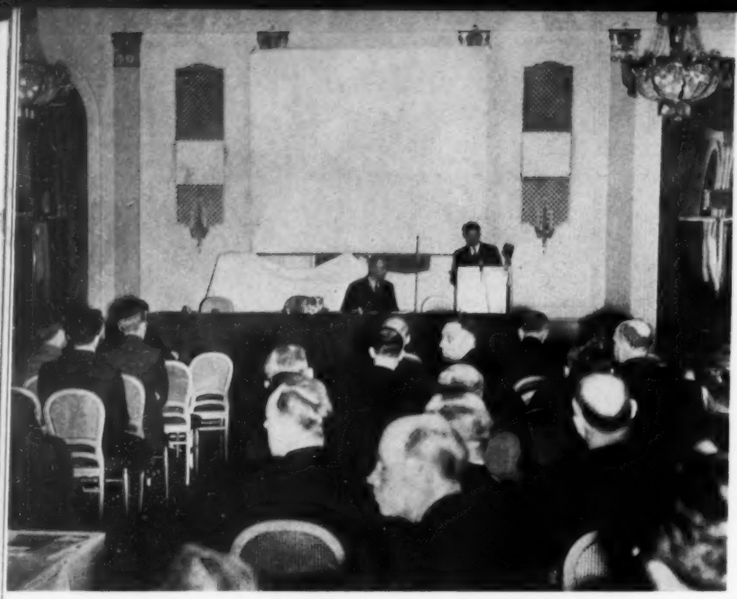
GEORGE O. VAN ARTSDALEN
Superintendent of Maintenance, Henry Disston & Sons, Inc., Philadelphia, Pa.

R. R. THOMAS, Chairman of the Birmingham Section for the year 1937-1938, is the assistant chief engineer, blast furnaces and steel works, Tennessee Coal, Iron and Railroad Company, Birmingham, Alabama.

Mr. Thomas began his career with the United States Steel Corporation subsidiary in 1907 as blue print boy at the Ensley Works. He became chief draftsman of the open hearth division in 1926 and was made assistant chief engineer of blast furnaces and steel works in 1929.

H. W. NEBLETT,
Engineering Department, Inland Steel Company, Indiana Harbor, Indiana.

R. R. THOMAS
Assistant Chief Engineer, Blast Furnaces and Steel Plants, T. C. I. & R. R. Co., Birmingham, Ala.



The electrical engineering section of the Association opened its sessions with F. D. Egan, electrical superintendent Bethlehem Steel Company, presiding. Donald Nelson, assistant electrical engineer, Jones & Laughlin Steel Corp., is seen presenting his paper.

Review of

33RD ANNUA C
IRON & STEE EX

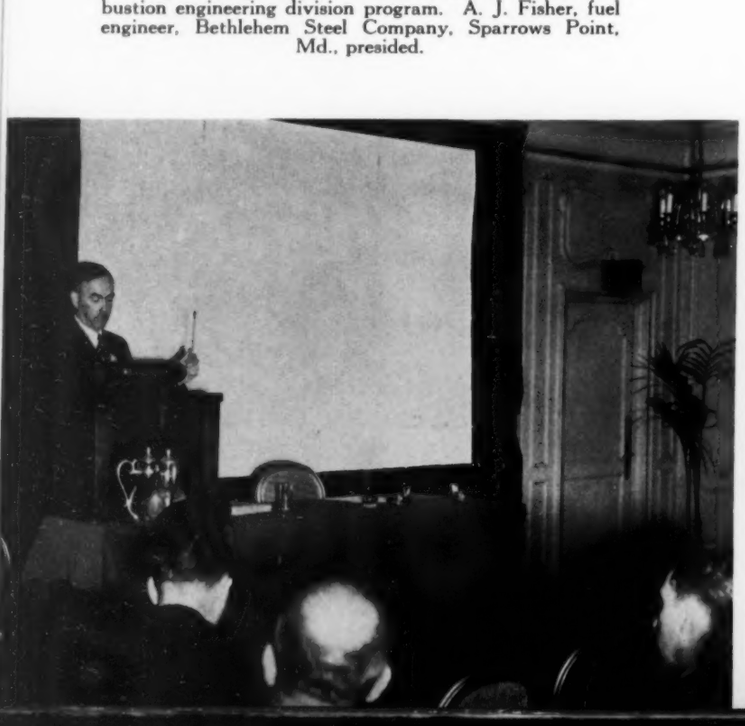
The Thirty-Third Annual Convention of the Association of Iron and Steel Engineers held in Chicago, September 28 to October 1, was unusual in many respects. Past records of registration and attendance at the Exposition were exceeded and the twenty-five technical papers elicited a most interesting and fact-finding series of discussion, which added greatly to the value of the papers presented. The Iron and Steel Exposition consisted of some three hundred booths of very attractive and modern design, and the products displayed was the greatest array of modern machinery and improved supplies ever exhibited by the Association.

The two inspection trips were well attended, about eight hundred visitors being included in the visit to the hot and cold strip mills of the Gary Sheet and Tin Division of the Carnegie-Illinois Steel Corporation, and about five hundred in the trip to the hot and cold strip mills of the Inland Steel Company. The Association has sponsored seven inspection trips of this nature during the last two years, and on every occasion they have proven of great interest and very instructive, particularly due to the im proved design of machines and improved practices noted.

The Welcome Luncheon held on the opening day of the Convention afforded a good opportunity for the visitors to survey the personnel of those in attendance, and get acquainted. It was attended by three hundred and fifty members and guests, including several steel company officials, who were welcomed to the city by Mayor Kelly's representative, Mr.

A. N. Otis, General Electric Company, Schenectady, N. Y., is seen presenting his paper which was the first on the combustion engineering division program. A. J. Fisher, fuel engineer, Bethlehem Steel Company, Sparrows Point, Md., presided.

Reading from left to right: F. M. Gillies, assistant general superintendent, Inland Steel Company, W. Mathesius, manager of operations, Chicago district, Carnegie-Illinois Steel Corp., W. S. Hall, chief engineer, Chicago district, Carnegie-Illinois Steel Corp., and W. Guy Hoffman, chief engineer, Gary Sheet and Tin Division, Carnegie-Illinois Steel Corp., acted as the hosts to the Association at the Welcome Luncheon.



CONVENTION *and* EXPOSITION

John H. Vohr, general manager, Granite City Steel Company, and M. J. Abbott, advertising manager, United Engineering & Foundry Company were among the many guests at the welcome luncheon.

Laron D. Gayton, City Engineer of Chicago.

The program of the Banquet held on the evening of September 30, was in commemoration of the work done by the Association in launching the National Safety Movement in Milwaukee, at the 1912 Convention. The immediate result of the action taken was the formation of an Organization Committee, and later the founding of the National Safety Council.

Under the leadership of Lew R. Palmer, the following very interesting program was arranged:

A Special Program

Commemorating the Twenty-Fifth Anniversary of the Founding of the National Safety Council

PRESIDING OFFICER

H. G. R. BENNETT—President of the Association of Iron and Steel Engineers.

Opening Remarks

TOASTMASTER

GANO DUNN—Honorary Member, Association of Iron and Steel Engineers.

SPEAKERS

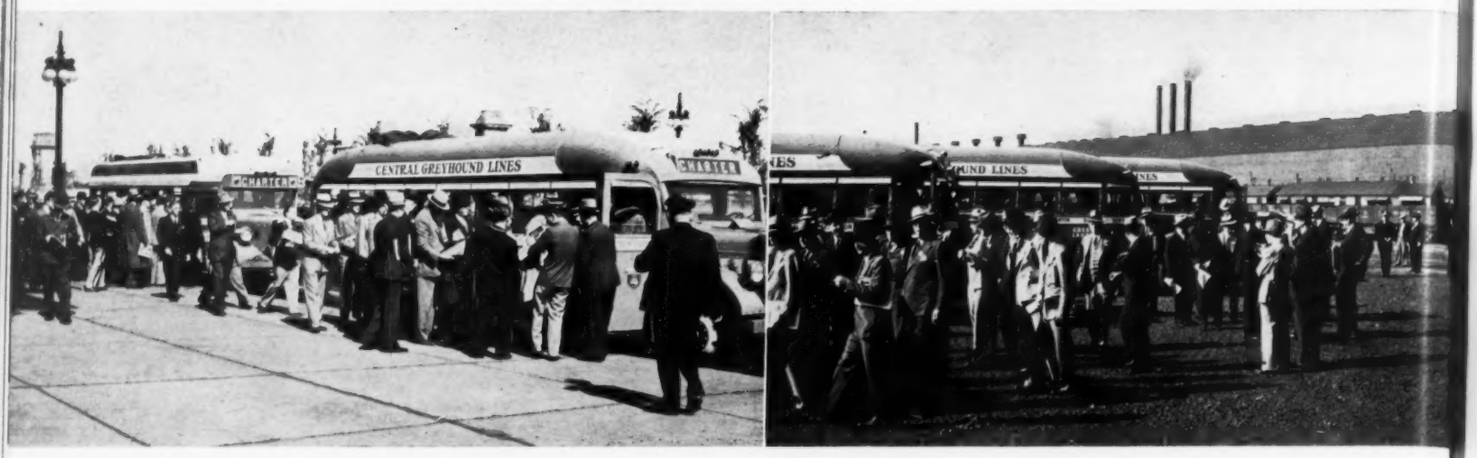
LEW R. PALMER—Past President, A. I. & S. E., and N. S. C.

Early Developments of the Safety Movement, leading up to the Formation of the National Safety Council.

Roll Call of the Original Organization Committee

Julius A. Clauss, chief engineer, Great Lakes Steel Corporation, Ecorse, Michigan, was very active at the convention. He presided at the mechanical engineering session held on Thursday afternoon.

Tuesday noon, opening day of the convention, the welcome luncheon was held in the Boulevard room in the Stevens hotel. Laron D. Gayton, chief engineer city of Chicago, represented Mayor Kelly in welcoming the Association to Chicago.



Loading the 800 members and guests of the Association at the Stevens hotel who made the inspection trip to the Gary Sheet and Tin Division, Carnegie-Illinois Steel Corp., on Wednesday afternoon. On the right is shown the buses arriving at the plant.

Birger Thele, test engineer, Tennessee Coal, Iron and Railroad Company, Fairfield, Ala., in the tin sorting and inspection department of the Gary Sheet and Tin Division, Carnegie-Illinois Steel Corporation.

(Lower Left) Reading from left to right, W. Mathesius, manager of operations, Chicago district, Carnegie-Illinois Steel Corp., J. M. Lose, vice president, in charge of operations, Carnegie-Illinois Steel Corp., and J. M. Darbaker, general superintendent, Gary Sheet and Tin Division, acted as hosts to the Association on Wednesday afternoon.

F. D. Egan, electrical superintendent, Bethlehem Steel Company, Lackawanna, N. Y., was among the members and guests making this inspection trip.

F. C. SCHWEDTMAN—First Chairman of the National Council for Industrial Safety. Pioneers in Industrial Safety.

ARTHUR V. ROHWEDER—Industrial Vice President, National Safety Council. Present Day Problems Confronting the National Safety Council.

L. H. BURNETT—Dean of Safety Work in the Iron and Steel Industry. What Safety has Contributed to Industry.

Message of Commendation to National Safety Council—H. G. R. BENNETT.

Response—W. H. CAMERON, Managing Director of National Safety Council.

There was occasion to alter the above program on account of the severe illness of two of the speakers, Mr. Gano Dunn and Mr. L. H. Burnett. President Bennett substituted for the former and Mr. John A. Stephens for the latter.

These several speeches will be published in the near future and distributed to our members and others interested.

A. V. Van Pelt of the Norma-Hoffmann Bearings Corporation, filmed the complete story of the convention and exposition, and it is planned to show these at meetings of the five district sections during the coming season. He is shown, upper right, in action during the inspection trip to the Gary Sheet and Tin Division. Below this is shown a group of members and guests starting the tour of inspection at the Inland plant. T. J. Flaherty, electrical superintendent, American Rolling Mill Company, Ashland, Ky., is in the center foreground. In the next view A. J. Castle, superintendent of the cold strip and tin mills, Inland Steel Company, is shown explaining a portion of the mill to one of the guests. Lower right—H. G. R. Bennett, president and Brent Wiley, managing director of the Association, are shown ready to depart after inspecting Inland's 76" Continuous mill. Immediately below are F. M. Gillies (left) assistant general superintendent and J. H. Walsh, works manager, Inland Steel Company, who acted as hosts during the Association's trip to that plant.

President elect of the Association, L. F. Coffin, (center), superintendent, mechanical department, Bethlehem Steel Company, Sparrows Point, Md., was among this group ready to start the tour of inspection through the Inland Plant.

J. S. Murray, (facing camera), chief electrical engineer, Follansbee Brothers Company, Follansbee, W. Va., was interested visitor on the trip to the hot and cold strip mills of the Inland Steel Co.

At the close of the Banquet meeting the prizes given for attendance at the Exposition were distributed in the following order: First prize for Steel Men, a Leica camera was won by Mr. George H. Schaeffer, Electrical Engineer, Carpenter Steel Company, Reading, Penna. The second prize, a gladstone bag was awarded to Mr. C. J. Duby, Chief Engineer, Youngstown-Warren District, Republic Steel Corp. The first prize, a golf bag, for exhibitors was won by Mr. T. V. Busk, Advertising Manager, Farrel-Birmingham Company, Inc., Ansonia, Conn.

Much credit is due the local committee for the success of the Exhibitors' Dance held the evening of September 28, and the programs for the entertainment of the lady visitors.

More than 11,000 persons visited the Iron and Steel Exposition at which 135 manufacturers of iron and steel mill equipment displayed their latest designs, many of them being in actual operation. Both the lower lobby (left) and the main ball room (right) of the Stevens hotel were used to house the displays.

Over 600 members and guests were in attendance at the banquet Thursday evening, commemorating the thirtieth anniversary of the Association and the twenty-fifth anniversary of the founding of the National Safety Council, by the Association. A. H. "Pop" Swartz was singly honored for his unbroken record of attendance at Conventions of the A. I. & S. E.

As the plans for the 1938 Spring Conference and the National Convention have not been completed, only partial information can be given at this time regarding these events. The Spring Converence will be held in Baltimore during the latter part of April—probably April 28, and 29, and the program will include several technical papers and an inspection trip to the hot and cold strip mill of the Bethlehem Steel Company at Sparrows Point, Maryland. The general arrangements will be similar to that of our last Conference with a technical session in the evening, one the following morning and the inspection trip scheduled for the afternoon of the second day.

The 1938 National Convention will be held in Cleveland the last week of September. The Technical sessions and the Iron and Steel Exposition will be held in the Public Auditorium, the location and facilities of which splendidly meet the requirements of our Annual Meeting. During the three days technical program there will be a trip to inspect the new hot and cold strip mills of the Republic Steel Corporation, which at that time will be the latest mills of this type, put in operation.

Further information regarding these meetings will be furnished as soon as the programs are fully developed and detailed information will also be published of the activities of the several district sections for the winter and spring period, which include technical programs of unusual interest and also very enticing social programs.

The Cleveland Public Auditorium—the site of next year's meeting. All technical sessions as well as the Iron & Steel Exposition will be held here under one roof, September 27, 28, 29 and 30.

RUSTLESS IRON
AND STEEL CORP.
NEW MILLS
DESIGNED AND BUILT BY
UNITED
ENGINEERING and FOUNDRY COMPANY
PITTSBURGH — PENNSYLVANIA
ASSOCIATED COMPANIES: DAVY AND UNITED ENGINEERING COMPANY, LTD., SHEFFIELD, ENGLAND
DOMINION ENGINEERING WORKS, LTD., MONTREAL, P. Q.

High quality stainless steel bars and rods are now being produced on this new mill of the Rustless Iron and Steel Corporation.

All of the rolling mill equipment including the 7-stand 12"-3-High Mill complete with rolls, special 2-speed gear drive, #75 sliding frame saw, 26" roll lathe, etc., was designed and built by UNITED.

The Electrolytic Cleaning of STRIP STEEL

By M. STONE, Manager
Development Dept.
United Engineering & Foundry Co.
PITTSBURGH, PENNA.

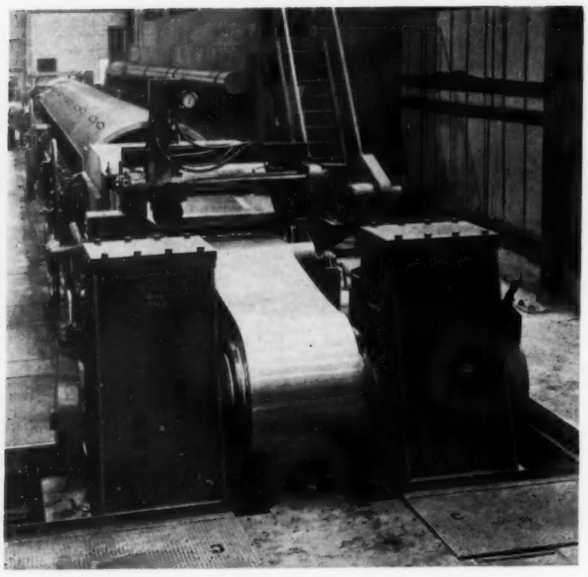
Presented before the A. I. & S. E. Annual Convention, Chicago, Ill., Sept. 28, 29, 30, Oct. 1, 1937.

▲ "CLEANING" of metal and metal parts defines a specific process, although the term is general and has been used miscellaneously in the past. Cleaning means oil removal. This distinguishes it from pickling, which means scale removal, i.e. the elimination of the oxides of iron, such as FeO, Fe_2O_3, etc. Both processes are essential parts of metal preparation for sale and further finishing, such as lacquering, plating, etc.—as well as the less specific cleaning off of dirt, lint, sludge, etc. The necessity for cleaning in the strip metal industry arises most generally at the present time in the preparation of thin strip—tin plate stock, as produced by the cold reduced method—for the hot dip tinning operation. It has long been established now, that unless the rolling oils that are used in the cold rolling of tin plate stock are thoroughly removed that the subsequent tin plate is more spotty, therefore less protection against corrosion, and hence of inferior value.

In the electroplating process, it is continuously the crusade of the platers to impress the users of this process that its success is highly dependent on the freedom of the material to be plated from any foreign substance whatsoever. Peculiarly enough, it is possible to clean too thoroughly—and we shall proceed to explain this seeming paradox immediately. Following the cleaning operation, in the cold reduced method of producing tin plate, comes the annealing. This is usually done in coils or sheet packs—and although it is a fact that too much oil left on the sheets causes stained steel (even in a so-called bright atmosphere) due to carbonization of the oil, too little oil results in increased "sticking" in the annealing process. The slight amount of oil left on to prevent sticking is burned off in the annealing operation, and hence the final product is oil free.

There have been many methods of removing oil from steel, and there are still many of them in use. The art is never stationary, and naturally enough, it resembles in many respects the art of cleaning practiced by your tailor. There are alkaline cleaners and soap cleaners, as well as emulsion cleaners and solvent cleaners. As examples of alkaline cleaners, we have caustic soda, trisodium-phosphate, etc.—and as to soap cleaners, familiar compounds involve olive oils and cottonseed oils, and the like—whose uses are declining due to cost and decreasing markets, but whose desirability is still existant for fine finishing, such as instruments, etc. Emulsion cleaners are typified by their action of forming an emulsion with the heavier oil or grease component, thus rendering them much more easily removable. Solvent cleaners are exemplified by trichlorethylene, carbon tetrachloride, etc.—such as are used in many tailoring and clothes cleaning establishments in "dry cleaning" processes. Sometimes combinations of two

M. STONE



Entry end of electrolytic line, showing exhaust system.

types of cleaning actions are made, and are the more effective. For example, the best way to remove tar from one's hands is to first use kerosene or turpentine, and then follow with hand soap for industrial purposes, a combination solvent and soap cleaner would be involved. It is not the purpose of this paper to develop the chemistry of cleaning—suffice it to say that for metal cleaning, compounds of very high pH values are necessary. pH values have to do with the hydrogen ion concentration of solutions, the high pH values indicating low concentrations of hydrogen and high concentrations of $_0$H—the latter being important to oil removal*.

Electrolytic cleaning of cold rolled strip is undoubtedly a progression from the original method developed by Thomas A. Edison for preparing incandescent filaments prior to coating. Its particular virtue over "still" (non-electrolytic) cleaning lies in the fact that in the neighborhood of the cathode (negative pole), which is usually the strip to be cleaned, a highly alkaline film is produced. Still further, the ability of still cleaning to penetrate into any surface pits or imperfections at the high rates of cleaning, is inadequate, and it is indeed here that the electric cleaner affords the final perfection in cleaning not attained commercially by other methods. Whereas cleanliness is necessary for metal to be hot dip tinned, it is all the more imperative prior to electroplating, and if the present laboratory activities on electrotinning materialize into commercial processes, the ultimate in cleaning will be required—if for no other reason than to make practical the "acid tins" over the "alkaline tins."

When a water solution of an alkaline substance is first subjected to a potential applied between electrodes, there is a current flow that quickly dies to a low value. If the potential is increased, the current increases only very slightly until a value is reached at which the current increases rapidly, and at a constant rate, with potential increase. For efficient cleaning, the electrolytic tank potential must exceed this so-called "decomposition voltage" to get appreciable current density at the work. Cleaning compounds with the lowest resistivities are the more desirable, since they do not require excessive generating apparatus to effect good cleaning. More recently the higher silicates of sodium, such as meta—and ortho—, dehydrolized and in concentrations from 2 to 4 oz. per gallon seem to be giving the best and most economical results, although other types of cleaners are used. Of course, the type of cleaner is dictated by the type of oil to be removed—and where an assembly of oils such as palm oil, mineral oils, soluble rolling solution, etc., are to be cleaned, the cleaning may be desirably cathodic or anodic, or the oils may be saponified or emulsified in their removal. Of course, all such cleaning processes are carried on at as high temperatures as possible, although certain emulsifying tendencies decrease with temperature, the "wetting" or breakdown in surface tension is an important factor, as well as decreased viscosity of the oil, allowing it to run off to some extent. In all cases the higher the alkalinity, the lower the specific resistivity, and hence the greater the current flow, and the consequent gas evolution or "gassing." This gassing is considered to be an important factor in oil removal, since in the electrolyzing of the bath, hydrogen is given off very intimately in contact with the strip (cathode) and helps to blast off dirt and oil.

Proceeding now from the chemical to the mechanical side of these continuous cleaning lines, considerations of a different nature come to the fore. Questions of speed of production, handling of material to and from the lines, control and guiding of strip, cost of production follow naturally. In the usual course of events, strip to be tinned has just been rolled in strip form in either a 4-high reversing cold mill or a tandem train, using undoubtedly a mineral soluble oil or palm oil. The cleaning operation comes next, since excessive carbon staining would occur in the annealing furnaces if the oils were not removed at this point. Subsequent temper rolling is performed dry, so that nothing further in surface preparation before tinning is required other than a white pickle.

Coils from the cold mills are usually tightly round, and in the more usual cases are about 36″ wide, some 6000 pounds in weight, representing a strip length of about 5000 feet, .010″ thick. These coils are delivered on their sides in front of the uncoiler, ready to be rolled into place. Vertically adjustable cone side guides quickly line up with the axis of the coil, and then they are run together, thus holding the coil central. For the lighter gauge material, the front end is manually fed into the welder, for joining to the preceding strip. Manually adjustable and operable brakes are furnished on each cone, and serve to help guide the strip, and provide a large part of the back tension that serves to maintain and guide the strip during its high speed travel through the equipment. For the heavier gauges, the uncoiler feeds are motor driven, with a large mag-

*See "The Cleaning of Metal" by R. W. Mitchell, Metal Cleaning and Finishing. 1930, No. 1-12.

netic brake which serves to provide back tension and also to keep the unwinding coil from throwing a loop when the entire line is decelerating.

Due to the high line speed of in excess of 900 FPM, it is deemed more expedient to stop the line for joining strips than to form a loop, which might in extreme cases, reach a 1000 feet and cause possible injury of the strip surface. The strips are joined by a specially adapted seam welding process, which makes a single seam across the strip in about 15 sec. after correct clamping and positioning. The seam is made very close to the leading edge of the following strip, which is placed above the leading strip, so that any loose flap does not impede progress through roll passes, etc. The weld is a continuous AC seam, and will develop high ultimate strengths, by virtue of its structure of overlapping spot welds—the steel being in a very clean state as concerns welding. After welding, the line is gradually accelerated to its top speed, after the strip joint has been properly threaded through the equipment.

As was mentioned earlier, metal washing can and does remove oil very effectively. The next unit in the line is a metal power washer, in which hot cleaning solution is sprayed into the strip from above and below at high velocities. Specially designed and spaced nozzles are supplied with the proper quantities of solution by a centrifugal pump, drawing from the large reservoir, into which it falls back after the washing action. This solution is maintained thermostatically at a temperature close to 200° F., steam being admitted to heating coils as demanded. For continuity of action, automatic float inlet valves assure the correct amount of solution at all times. For the guiding of the strip through the washer, idler rolls are provided on the entry side, and to prevent the all-important "drag-out", a set of disc-cloth wringer rolls are mounted at the delivery end. The function of this washer is important and it may be said that the combined chemical and mechanical action in this unit is responsible for the removal of the larger part of the oil and dirt. In order to keep the electrolytic tank, next in line, from undue contamination, as well as improved cleaning for certain oils, the power washers are frequently furnished with a set of separately driven tampico brush wheels, mounted so as to revolve against the direction of the strip, brushing from above and below simultaneously. This entire power washer unit is placed on a special foundation, which contains a built-in concrete tank, into which the entire contents of the washer can be drained in a matter of minutes, and from which it may be subsequently pumped back by specially provided pumps. The solution in this washer is, where possible, the same as that used in the electrolytic tank, except that in many cases, an additional emulsifying and wetting agent is added, care being taken that foaming does not take place, since this tank is highly agitated. The entire washer is completely hooded, and is connected to the fume exhaust system, when such provision is furnished.

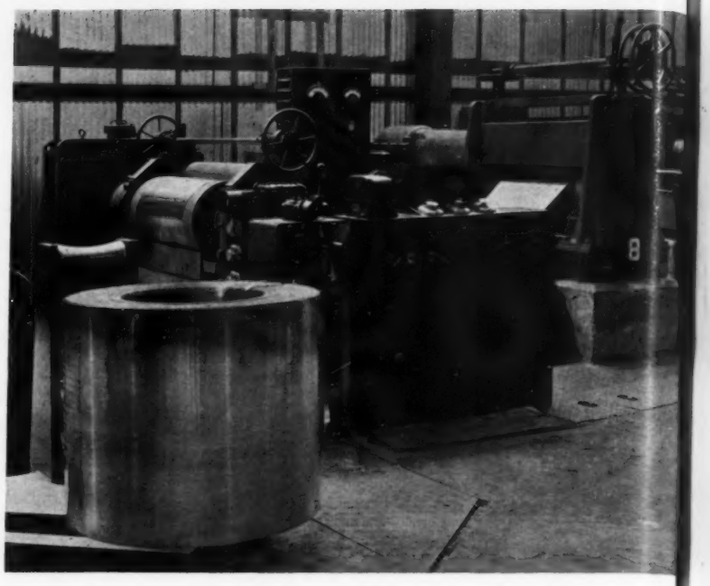
The partially cleaned strip next enters the electrolytic tank, which produces the final chemical cleaning action, as described earlier. The mechanical requirements in this piece of apparatus are exacting. The tank, which is in excess of 60 feet, is a single compartment tank, with a large single floating type submerging roll at each end to bring the strip to the proper subsurface pass line. The strip, at this pass line, passes between several sections of specially designed large surface electrode grids spaced along the entire length of the tank. The lower grids are relatively fixed, while the upper are made removable for repair purposes, and ease of threading a new strip. Special covered support rolls, in conjunction with the line tension, serve to maintain the strip at its proper pass line, so that equal cleaning is obtained on both sides of the strip. Electrically, the tank system is divided into two sections, although the tank proper is kept out of the electrical circuits. This prevents current leaks, and permits independent operation of the two electrolytic generators on the same tank of solution, thus eliminating troubles of parallel operation. All such matters, as well as the possibility of stray or uncontrolled currents are kept to less than 2%, primarily due to the enormous ratio of solution to strip specific electric resistivities—being about $3\Omega/in_3$ for the solution, as against $12 \times 10^{-6}\Omega/in_3$ for steel. As referred to earlier, the decomposition voltage must be exceeded to establish proper cleaning—and the accompaning curves show the voltage—current relation, establishing a decomposition voltage of about 2.75v for this particular solution and the electrodes as used. The practical variations of this fundamental characteristic with line speed, bath alkalinity, etc., are shown, as well. As the bath is normally operated, the spaced electrodes are the anodes, the strip being the cathode, the current returning to the negative side of the generators through specially arranged current collectors. The solution is kept hot, as in the power washer, and maintained thermostatically by controlled steam admission to heating coils. Automatic inlet and overflow valves are provided. Violent vaporization goes on all the time in this tank, and hence the entire tank is hooded, with hinged side flaps to relieve

General view of delivery end of electrolytic cleaning line.

vapor pressure and gas puffs—the fume exhaust sustem is connected in at three points. This tank is also arranged for emptying and filling from an emergency cellar sump. Dragout rolls are provided at the delivery end.

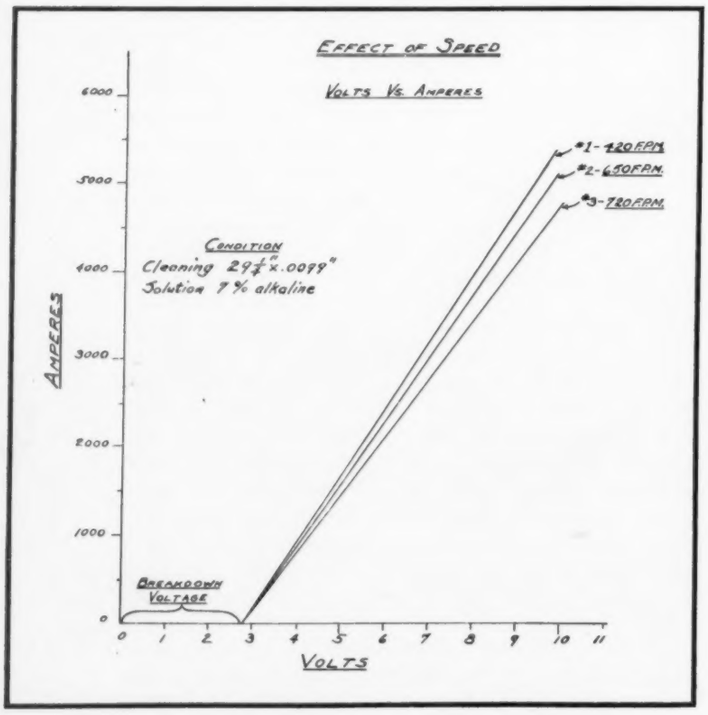
As some smudge and non-soluble dirt may at times remain on the strip, the next apparatus item is the scrubbing unit. The strip, in passing through this unit, passes over and then under large backing rolls, against which tampico brushes are rotated at high speed against the direction of travel, and at considerable pressure. Water sprays play on the strip, as it is brushed, contributing to both better brushing and extended brush life. Warm water is used, as furnished from the mill supply, after having passed through a controlled heat exchanger. The entire scrubber is properly enclosed by splash guards, the water wasting to the sewer.

The final unit in the cleaning operation proper is the hot water rinse, and is simply a tank of the proper length for a one second dip in practically boiling water, with vapor hood and exhaust system connections. Large floating type submerging rolls control the strip passage through the tank. The question might reasonably be asked why water from this tank is not supplied the immediately adjacent scrubbing unit; the answer being one of cost, since the scrubber water need not be hotter than, say, 120° F. The strip, upon leaving the rinse tank is hot enough that it need only to pass through a series of cloth wringer rolls to be completely dry and ready for recoiling.



Control desk at delivery end of electrolytic cleaning line.

Effect of speed—Volts vs. Amperes



The problem of recoiling at high speeds from a processing line has required a unique combination—controlled set of pinch rolls, tension drag, and tension reel. Immediately following the drier rolls comes the driven pinch roll stand which pulls the strip through the line of cleaning requirement—the rolls being covered to prevent strip marking. The function of the next unit is two fold: to control the strip laterally to produce a straight sided coil, and to provide the correct back tension for the final reeling. For this purpose, the strip is looped between this tension drag unit and the preceding pinch rolls, so that the strip enters the drag unit at practically zero tension. The unit, itself, comprises essentially a set of rolls around which the strip is wrapped, forming a 'flying winch". The strip wraps around these rolls being guided on the low tension side by carefully set tapered guide-rolls. The strip tension is determined by the setting of the tension roll, which pinches the strip, the angle of wrap, and the friction coefficient. Thus this unit combines in one machine the two simple principles, as exemplified by the ease of guiding a belt on the loose side (as compared with the tight) and the tension control obtained in "taking a hitch around a post with a rope". From this unit, the strip goes to the tension reel itself, which is furnished with the latest in collapsing and stripping mechanisms. The motors of these three units are all run off a single Ward-Leonard motor-generator set, with an adjustable load current relay in the reel motor armature circuit to control reeling tension, an adjustable field rheostat in the tension drag motor circuit to set the line speed, and manually adjustable field rheostat in the pinch roll circuit for synchronization. Although in starting up the line, all electric machines are motors, normal operation demands that the tension drag unit act as a generator and feed current back into the

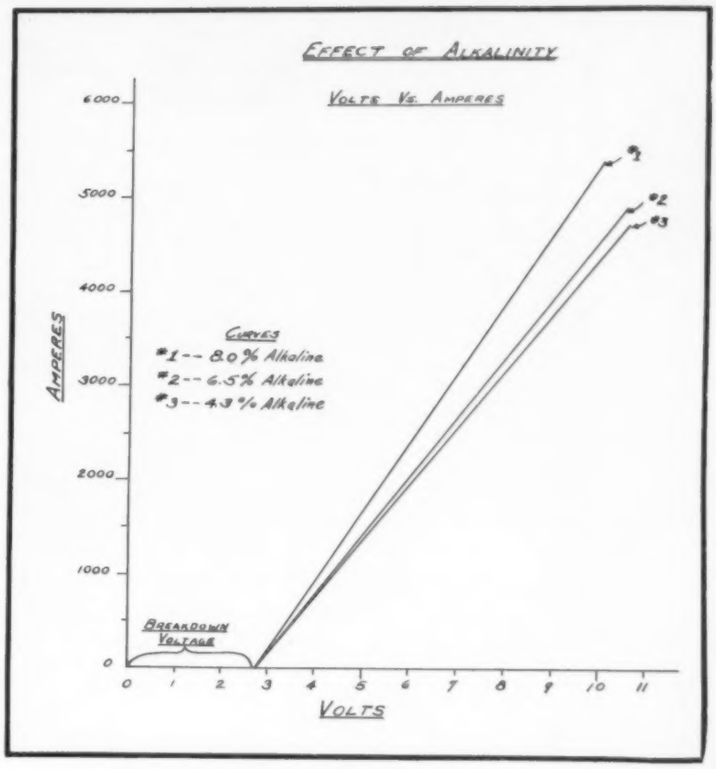
Ward-Leonard set. In this manner, accuracy, ease, and flexibility of control is obtained for accelerating, decelerating and top speed operation. The main control station is near the delivery end of the line, where the operator has at his command the electrolytic current settings, tank alkalinity, line speed, strip synchronization, etc. An auxiliary control station is located at the welder. An interlocking control automatically reduces the electrolytic generator fields to zero when the line stops, so that no strip burning occurs at shutdown. The matter of the proper reeling tension is a compromise operator's decision to the end that the coil is tight enough to handle well, and not so tight that sticking occurs in the annealers.

By a proper design and balance of electrical and mechanical units, cleaning speeds in excess of 900 FPM have been obtained. It must not be assumed, however, that line production is simply a function of strip speed—the operations of inserting new coils, seam welding, threading, accelerating, decelerating, shearing, and feeding into the reel cut down the effective time to about half, depending on the length of coils being handled. The net result, however, is a high production, efficient unit. When it is realized that the total cleaning time is only about 10 seconds, made up of about 7 seconds in the electrolytic bath, and 1 second each in the power washer, scrubber, and rinse bath consecutively, one gets an idea of the job involved. Record 8 hour turns have produced tonnages of tin plate in excess of 125 tons, when mill conditions have permitted continuous and flawless operation.

In some plants, the line is arranged for cutting the strip into sheets on the fly, and piling, after side trimming. To-date, the limitation of tin plate flying shear speeds have not permitted line speeds as high as mentioned above, but the continuity of the operation by virtue of the elimination of the manual shearing out of the welds helps to compensate, and very acceptable production records can be made with this arrangement as well. Developments under way at the present time indicate that shears will be shortly available to accurately shear tin plate at speeds even in excess of the cleaning speeds used to date.

A factor of considerable import in the cleaning process is the cost—and it is here indeed that the electrolytic method has proved itself. Many plants show cleaner costs varying from $ .10 to $ .20 per ton of tin plate strip cleaned, which, when modified by labor, maintenance and interest and depreciation costs, would be somewhat less than $1.00 per ton. Competitive cleaning methods, to-date, have not been able to show these economies.

As was mentioned earlier, improvements on even present performance are being made. Still higher speeds and decreased mechanical interferences in operation are definitely in view. Extension of these principles and methods to the non-ferrous industries is a matter of impending consideration. Beginnings have already been made for special processing in the heavier gauges and greater widths. The projects that have been herein discussed have been a point development of the Hanson-Van Winkle-Munning Company in conjunction with United Engineering & Foundry Company.



Effect of Alkalinity—Volts vs. Amperes

General view of electrolytic cleaning line.

What SAFETY Has Contributed to INDUSTRY

By L. H. BURNETT, Vice President
Carnegie-Illinois Steel Corp.

Presented before the A. I. & S. E. Annual Convention, Chicago, Ill., Sept. 28, 29, 30, Oct. 1, 1937.*

▲ WHEN our good friend, Lew R. Palmer, suggested that I participate in these proceedings, commemorating the Twenty-Fifth Anniversary of the Formation of a National Organization devoted to securing increased safety to human life, I gladly accepted the assignment as it afforded me an opportunity to pay just tribute to your great organization for its wisdom and foresight in forming such an organization, and to express my admiration and undying respect for those great men, those pioneers, who composed the first committee appointed on that momentous occasion in Milwaukee, just twenty-five years ago.

It is my rare privilege to have known most of them personally and to have enjoyed the advantage of their wise counsel and sound advice in safety matters. They fully realized the absolute necessity for co-operation and organization to successfully combat the rising tide of industrial accidents. They were indeed real pioneers in safety and their contribution to the cause cannot be overestimated.

Your organization enjoys an enviable reputation for your contributions to science and industry and for your most commendable work along educational lines, but, in our humble opinion, your action in fostering the formation of a National Organization devoted to securing increased safety to human life will ever stand out as one of the greatest contributions to human welfare.

There is another excellent reason for my prompt acceptance of the invitation. It has been my privilege to appear before you on at least three previous occasions and I could not help but remember your unfailing kindness and courtesy to me. I recall that at one of the meetings in Pittsburgh many years ago I had the honor of acting as Toastmaster at your Annual Banquet. I introduced the speakers in prose, poetry and even in song, and when you permitted me to get away with the song, I was more than ever convinced of your friendliness as well as your forbearance.

May I admit, however, that it was somewhat of a shock to me when I glanced at your program tonight and noted the designation as "Dean of Safety Work in the Iron and Steel Industry". I sincerely appreciate the honor thus bestowed upon me, but it carries with it, nevertheless, the implication of advancing age and a reminder that "time marches on" and that the young man who addressed you a few short years ago has become the veteran, clothed with years of experience and I hope, possibly, some small degree of wisdom.

While a few states enacted certain safety and factory inspection laws as early as 1887, the real concerted safety movement did not begin until 1906, when the United States Steel Corporation and other leading corporations launched a vigorous campaign against industrial accidents.

L. H. BURNETT

The first great technical association to appoint a safety committee was the Association of Iron and Steel Electrical Engineers, formed in 1907. Your association was among the first to engage in organized safety work, devoting your time and energy especially to the elimi-

*Presented by John A. Stephens, Manager Industrial Relations, Carnegie-Illinois Steel Corporation, Chicago District.

nation of hazards involved in electrical operation of steel mills.

Your excellent work in this particular field brought home to you the realization of the absolute necessity for a great National Organization, devoted to "the promotion of safety to human life", and resulted in the ultimate formation of the National Safety Council.

The members of the committee appointed in Milwaukee were men of vision and courage, but in the formation of an organization devoted to safety, they builded better than they knew or even hoped for. The National Safety Council, through the able leadership of its officers and directors and especially through the tireless efforts and devotion of Mr. Cameron, has become the largest and most influential safety organization in the world. It has extended its influence and assistance far beyond the industrial field and today is composed of twenty-seven sections, embracing practically every form of human endeavor.

The National Safety Council was not only founded and organized, but fostered and financed by the Iron and Steel Industry until it became well and firmly established. The Metals Section of the Council is among the largest and most active today and some of its important contributions to the Industry have been the compilation of safe practice pamphlets; the furnishing of reliable accident statistics; the promotion and formation of safety codes, and the establishment and maintenance of local councils.

That great organization, with its thousands of members in various branches of industry and commerce, has earned the respect and confidence of the public, and will in the near future celebrate its Twenty-Fifth Anniversary of most worthy and valuable accomplishments in the field of safety and welfare. Industry, in general, may well join in wishing the National Safety Council many more years of success and usefulness.

It is thus seen that organized safety work in Industry began more than thirty years ago, and has progressed through the years by the difficult process of trial and error, rejecting the bad and retaining the good, and while we have experienced some disappointments and setbacks, the war against industrial accidents has never faltered and year after year we have continued to make some substantial gains and to approach nearer and nearer to our goal, the elimination of all unnecessary and preventable accidents.

Time does not permit even a bare recital or description of the various steps and advances which have been made in safety work, including the period of mechanical safeguarding; the period of general education of employees; the utilization of plant and department safety committees; the reliance upon the foreman as the "key-man", not only in safety but in all matters pertaining to industrial relations, and finally the realization that safety of employees is an obligation of the Operating Department to the same extent as quality and quantity of product.

Job analysis and job training are important features of safety work as applied to apprentices and other new employees, and it is now a regular practice to give special attention to such employees while they are being introduced to their new jobs.

It became evident in the early days of the safety campaign that prompt and expert surgical attention saves many lives and often returns men to the job who would otherwise have been permanently and totally disabled. Training of men to report for treatment of minor cuts and bruises has resulted in the practical elimination of cases of infection. Physical examinations, when properly conducted, have served to eliminate many men who would have been a menace to themselves and to their fellow employees and have given such men an opportunity to correct their physical defects or adjust themselves to more suitable jobs. Completely equipped emergency hospitals on the plant are also an absolute essential.

It has always been the primary duty of the employer to provide a reasonably safe place in which to work. Thirty years ago this obligation was fulfilled by furnishing a place which did not present unusual dangers or unexpected pitfalls. The modern conception of a safe place to work, however, is much broader and includes practically every known safeguard, not only as applied to machinery but also to the person. Today a safe plant must be clean and well ventilated; must have clear and well marked aisles; safe stairways and walkways; be well lighted and have an ample supply of good drinking water at the proper temperature. There must be proper sanitary conditions and expert medical and surgical service at hand. Where and when necessary, employees should wear safety shoes; should be supplied with suitable goggles, as well as protective clothing and respirators in certain occupations.

The application of engineering skill has been a very potent factor in the reduction of the number of accidents in Industry, and particularly in connection with the reduction of the high severity rate of accidents. In modern practice, the complete layout as well as detailed plans and specifications for all new construction is carefully checked by competent engineers for safety, to insure proper clearances and to provide ample spaces for the work to be performed. All orders and specifications for new mills, furnaces, elevators, cranes and all other machinery are similarly examined to see that the necessary safeguards are provided and carried out in the final construction. The degree of improvement in working conditions and the extent of reduction in the frequency and particularly in the severity of accidents through the use of such engineering talent are among the most outstanding accomplishments in the safety movement. They are really impressive to one who has followed this development during the past twenty-five or thirty years.

It has been my good fortune to be associated for thirty-six hears with a Company that has fully realized its obligation to its employees and has been active in organized safety work since 1906. To one who has been associated with the safety movement since its inception, the advances that have been made in the construction and operation of plants, with a view to eliminating accidents, has been little short of marvelous, and much of that work is due to the skill and ingenuity of the members of your organization.

The work of making plants and processes safe is becoming more and more a real engineering job. Pro-

viding ample spaces and clearances; the best of lighting; adequate toilet facilities, and good drinking water at a proper temperature, is often quite costly, but it pays real dividends in the safety and comfort as well as the efficiency of your employees.

Mr. Earl Blank, Director of Personnel Relations of Jones & Laughlin Steel Corporation, in a recent address before the American Iron and Steel Institute in New York, stated that it cost $40,000.00 to incorporate into their new strip mill safe clearance between the end trucks of overhead electric cranes and building columns. This is indeed a considerable expenditure, particularly for safety, but I am sure that every one of you will agree that it is thoroughly justified in the light of our experience.

It is my understanding that your program includes visits to the modern mills of Carnegie-Illinois Steel Corporation and Inland Steel Company. You will note the thorough mechanical safeguarding; the wide aisles; ample working spaces, and the exceptional lighting. Every known device for the safety and comfort of the employees has been installed.

Organized safety work has been so effective, has brought about such betterments in working conditions, that a man working in an industrial plant today is much safer than on a public highway or even in his own home. He has become a preferred risk for life insurance.

There are no figures which can give us even an approximate estimate in dollars and cents of the real savings to Industry brought about by safety. The records of the Steel Corporation, however, show that since the inception of organized safety work thirty years ago, serious and fatal accidents have been reduced 62%, and more than 78,000 employees have been saved from serious injury and death. It is fair to assume that other Steel Companies and other industries have had similar experiences. Whether we view such records from an economic or humanitarian standpoint, they show clearly that safety is the one outstanding achievement of modern industry.

Safety began as a purely humanitarian measure, to save lives and limbs, and to prevent pain, sorrow and suffering. There was no thought of saving money or improving efficiency. The movement has gone forward in practically every industry in every State and has become a permanent and important feature of every industrial relations program.

It is indeed fortunate that the high ideals exhibited at the beginning of the movement have been maintained throughout the years. Safety, however, has paid a thousand times over and will continue to produce dividends of peace, happiness, contentment and money to ourselves and to our employees and their families.

I desire to close this talk by repeating a slogan which Carnegie-Illinois Steel Corporation has used for many years in its little pamphlet given to employees entitled: "General Instructions to Employees to Avoid Accidents". I do not know the author of the slogan and, therefore, am not able to give him credit, but to my mind it adequately expresses the real meaning of safety:

"And the end is that the workman shall live to enjoy the fruits of his labor; that his mother shall have the comfort of his arms in her age; that his wife shall not be untimely a widow; that his children shall have a father, and that cripples and helpless wrecks who were once strong men shall not longer be a by-product of industry".

The Association has on hand at the national office, 1010 Empire Building, Pittsburgh, Penna., a supply of the new Association pins. Every member should have one of these attractive insignias. The cost is $1.00. Address the national headquarters for yours.

STATEMENT OF OWNERSHIP, MANAGEMENT, ETC., OF

IRON AND STEEL ENGINEER

(Required by Act of Congress of August 24, 1912)

Name of Publication: Iron and Steel Engineer, published monthly at Pittsburgh, Pa. (Report of October 1, 1937).

Editor—Brent Wiley, Empire Bldg., Pittsburgh, Pa.

Business Manager—James D. Kelly, Empire Bldg., Pittsburgh, Pa.

Names and addresses of stockholders holding 1 per cent or more of total amount of stock: None.

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1937

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BRENT WILEY, Editor.

Sworn to and subscribed before me this first day of October, 1937.

G. WILLIAM JONES, JR., Notary Public.

(My commission expires February 9, 1939.)

DRIVES and CONTROL

For A Modern Rod Mill

By R. H. WRIGHT and B. J. AUBURN
Steel Mill Engineer Control Engineer
Westinghouse Electric & Mfg. Co.
EAST PITTSBURGH, PENNA.

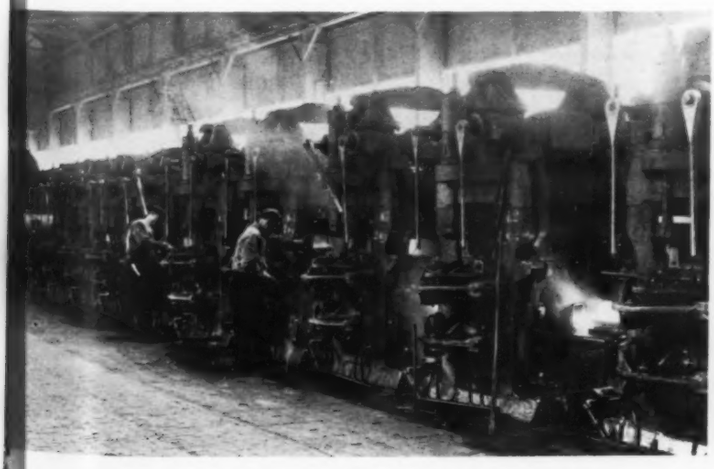
▲ THE production of rod, the raw material for wire drawing, is a highly specialized undertaking. Large tonnages of No. 5 rod, which has a diameter of 0.207 inch, is used in drawing small and medium sizes of wire. Larger wire sizes are drawn from rod ranging up to about one-half inch in diameter.

One of the large steel companies has recently placed in operation at Joilet, Illinois, two duplicate continuous rod mills designed for quantity production of steel rod of high quality. Each mill has a continuous, gas-fired heating furnace into which cold billets $2\frac{5}{16}$ inches square and 30 feet long are charged. The heated billets pass completely through 19 sets of rolls in approximately 75 seconds and the finished No. 5 rod leaves the last roll stand at a speed of 3500 feet per minute. In this short time the original 30-foot billet has been elongated to about 4500 feet. Two strands can be rolled simultaneously, so that two rods 4500 feet long, 0.207 inch in diameter and almost white hot are delivered from each mill every 75 seconds.

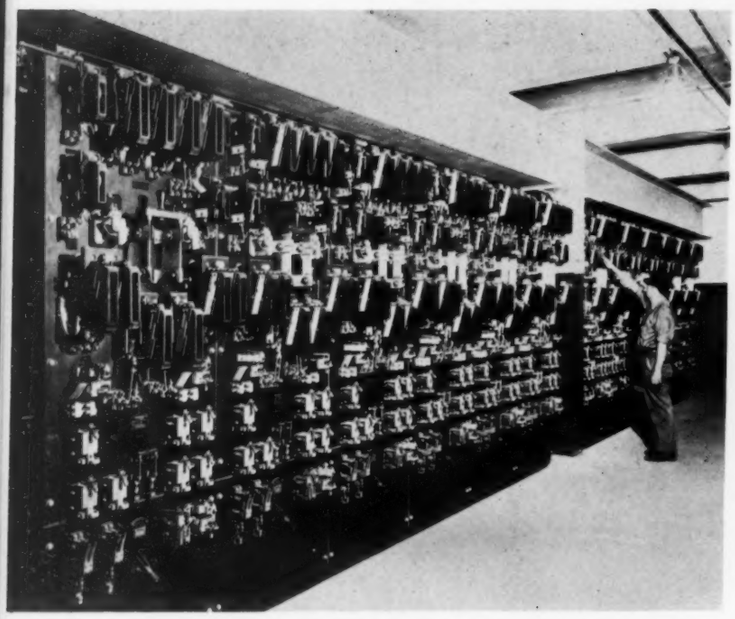
One of the principal considerations in operating a mill of this type is the disposal of the finished product as it is delivered from the mill. To accomplish this, each mill is equipped with six reels into which the hot finished rod is coiled as it leaves the mill. A system of pipes makes it possible for the operator to direct each successive rod into the desired reel. Although only two strands can be delivered simultaneously from each mill, six reels are required for each mill because of the time required for acceleration, stopping, and unloading. All twelve reels are electrically driven and the equipment differs somewhat from that used in previous installations.

Each reel consists of a vertical spindle that carries at its base a circular steel plate on which are mounted two sets of vertical pins, located concentrically. A second movable steel plate with holes to clear the pins rests on top of the plate which carries the pins. The upper plate, on which the coil of rod is formed, can be

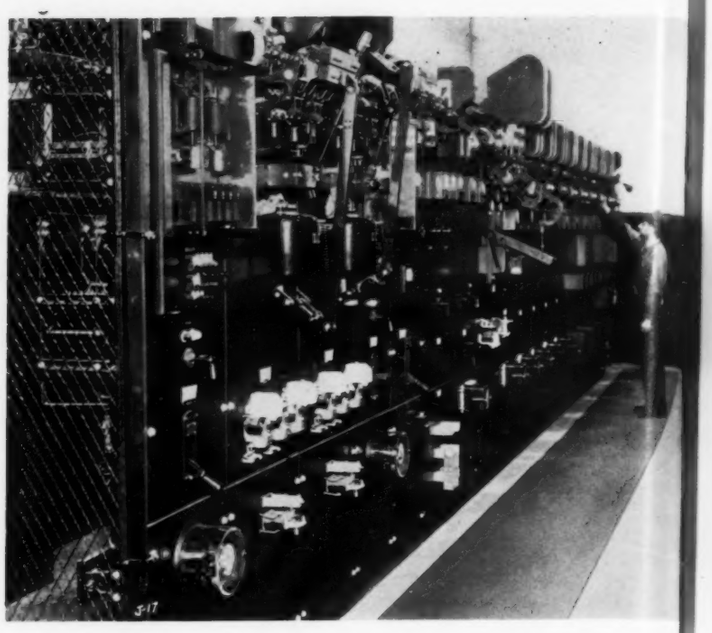
General view of one of the new continuous rod mills at Joilet, Illinois.



General view of the driving side of one of the new continuous rod mills at Joilet, Illinois.



These 12 panels (6 in each group) control the twelve electrically driven reels.



Incoming power control board. One of the broad-range voltage regulators for the reel generators is shown at upper left.

lifted vertically by a hydraulic mechanism so as to clear the pins.

In making a coil, the reel is accelerated to the correct speed and the oncoming rod is directed between the two concentric rows of pins. The rod fills the annular space between the pin circles and forms a neat coil resting on the movable circular plate. When the coil is completed, the reel is brought to rest as rapidly as possible. The plate with its coil is lifted from the reel to a system of conveyors on which the rod is allowed to cool. The reels are mounted below the mill floor and the coils are discharged at the floor level.

Each reel is driven by a 125-hp, 230-volt, 400/1200 rpm, compound-wound, adjustable-speed motor. It is of the bracket type, has roller bearings, and has on the top half of bracket, openings and semi-enclosing screens on the bottom half. These motors are built for a temperature rise not exceeding 55°C. at 125 hp., 600 rpm., 230 volts. The operating speed of the motors is 140 to 520 rpm., by voltage control and 520 to 1200 rpm. by field control. A speed of 520 rpm., corresponds to 300 volts on the armature, supplied from a 75/300 volt variable-voltage bus. The motor fields are excited from a 250-volt exciter circuit. The motors are arranged for horizontal mounting and drive the reels through bevel gears. A shunt-wound, marine-type, magnetic brake mounted on the reel drive shaft assists in bringing the reel to rest after each coil is completed.

The power for each group of six reel motors is delivered by a 300-kw., 75/300 volt, shunt-wound separately-excited generator. These two generators and a 500-kw., 250-volt generator for the mill auxiliaries are driven by a 1600-hp., 6600-volt, 60-cycle synchronous motor. The excitation and control circuits are supplied from a 40-kw., 230-volt, shunt-wound, direct-connected exciter. The synchronous motor is started at full voltage.

To withstand the unbalanced weight of 400-pound coils with this mean diameter traveling at a speed of 40 miles an hour, the reels have to be of heavy construction. The flywheel effect, accordingly, is quite high. Furthermore, the time for acceleration and deceleration is limited, thus imposing severe duty on the driving motors and control. The normal time for one complete cycle is about 60 seconds, of which 7 to 8 seconds is for acceleration, 30 seconds running at full speed, 6 seconds for deceleration, and the remainder with the reel at rest for discharge of the coil.

A separate control panel is provided for each reel motor, with the following operating features.

1—Time limit acceleration to base speed is obtained with a five-point, four-step starting resistor. The resistor is designed to give 100% full-load current inrush on the first point for about 0.3 second and approximately 190% on each successive step including the last step. The first inrush barely starts the reel, without shock, thus reducing the shock effect of the second inrush, of 190%.

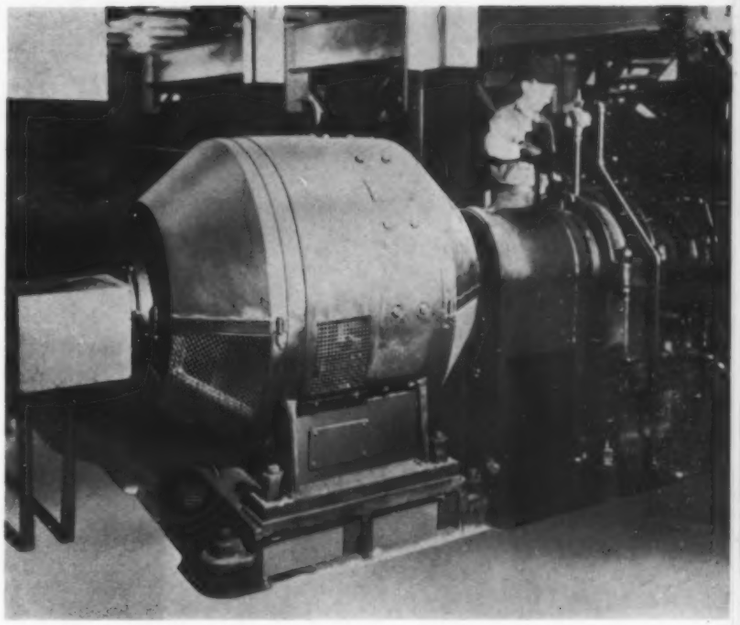
2—Full-field excitation is maintained during acceleration on resistance by a field relay. As soon as the last resistance step is cut out this relay functions to bring the motor to full speed or a speed determined by the position of shunt field rheostats. The armature current during acceleration by field fluttering is maintained at 165% current.

3—Deceleration to base speed is brought about by a field-fluttering relay and from base speed to standstill by timing relays and three steps of dynamic braking. The current is limited to 140% full load to base speed and to 75% on the first point of dynamic braking and

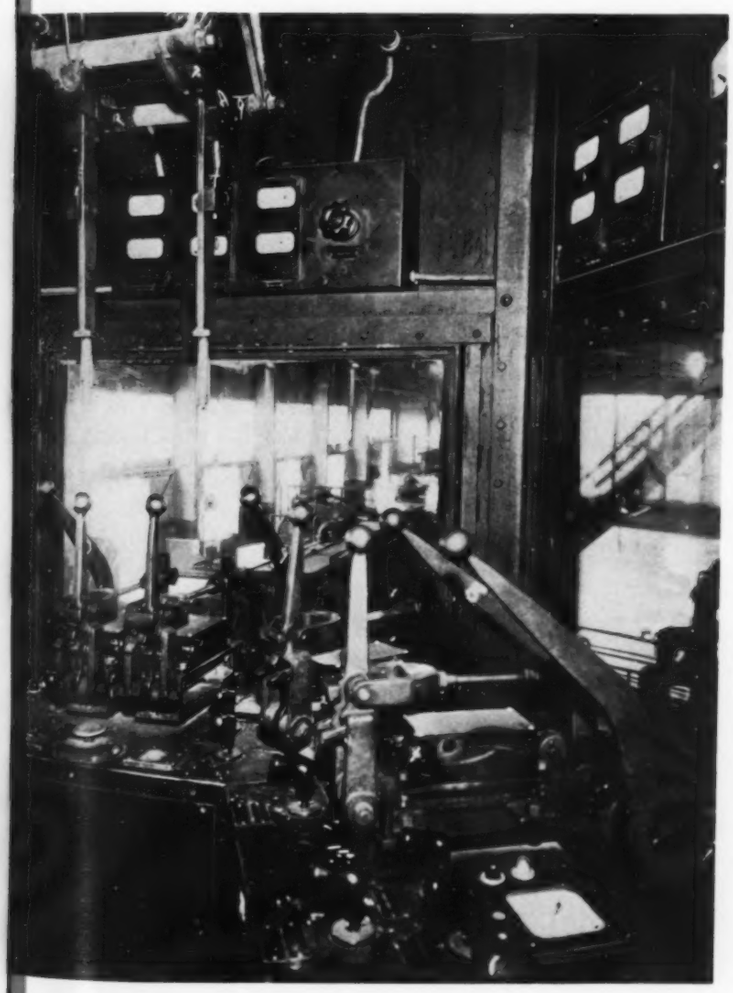
125% on the second and third points. The shunt brake is applied about the time the second dynamic braking point is cut out.

A unique feature of the control are the operator's benchboards one of which is provided for the reels of each mill. The benchboard shape eliminates all unnecessary moves on the part of the operator. Standing in front of the middle section, the operator has all six controls within his reach. Each of the six sections of the benchboard has both control switches and hydraulic valve control levers. The hydraulic levers by which the movable plate of the reels is raised and lowered are electrically interlocked to control the starting and stopping of the reel motors at the same time. When a finished coil is raised to the discharge position, the reel is stopped. When the movable plate is lowered to the position to receive a new coil, the reel is started automatically.

The top of the benchboard also carries control switches for the main and vernier rheostats, which regulate the speed of the reel motors. The main rheostat is used for rough preliminary adjustments and the vernier rheostat for final speed adjustment during coiling. The position of the vernier rheostat is indicated by a synchro-tie transmitter and position indicator mounted on top of benchboards. The motor ammeters and speed indicators are mounted on a steel panel above the windows in the control pulpit and slightly above the operator's line of vision.



125 H.P., 230 volt, 400/1200 rpm, compound-wound, adjustable-speed motor for driving each reel.



Operating pulpit for controlling six of the reel motors. A similar pulpit controls the other six.

When a mill is in full production, two reels are receiving rods and the others are either accelerating, decelerating, stopped, or idling. This condition imposes considerable load fluctuation on the reel generators. It is of absolute importance that the voltage of the reel generators remains constant at all times. To secure constant voltage, each generator is provided with a voltage regulator. The regulator is of the broad-range type since voltages from 75 volts to 300 volts are being employed depending on the product rolled. The regulated voltage assures constant speed of the reel motors and proper matching of their speed to the speed of the last stand of the mill.

A considerable amount of water is used by mills of this type so the mill proper is elevated 14 feet above the ground level to insure good drainage. Space is available, therefore, on the ground level for reel drives, control equipment, oil tanks, etc. The control panels, starting resistors, rheostats, etc. are located in the control room almost immediately below the operating pulpits, a design which lends itself readily to a simplicity and economy of the whole installation.

RUSTLESS STEEL CORP. DOUBLES ITS CAPACITY

▲ RUSTLESS Iron and Steel Corporation doubled its production capacity with the formal opening of a new $1,500,000 addition to its stainless steel plant, providing for a 20,000-ton expansion of the Company's annual ingot capacity. This is the world's only plant exclusively engaged in the production of stainless steel, and the only one performing every step in the manufacture of stainless steel bars, rods and wire, from the virgin chrome ore to the finished product.

Completion of this plant addition is designed to retain for Rustless its position among the three or four leading producers of stainless, the specialty metal which has become known as the jewelry item of the steel industry. With conventional steels selling at an average price of about 2¢ a pound, stainless in its various forms sells at from 20¢ to 50¢ a pound.

In addition to a modern three-high type 12-inch merchant bar mill housed in a 240 by 80-foot monitor type building and equipped with a 10-ton 80-foot span overhead crane, billet heating furnaces, cooling pit, etc., the new additions include three 12-ton electric furnaces, equipped with 3500 KVA transformers, a 60 by 323-foot brick and steel building housing equipment for cold drawing and finishing rustless steel bars in straight lengths; a two-story service building, containing a dispensary, lockers, shower and dressing rooms, and personnel office, a new electrical substation and transmission lines; cranes, storerooms and transportation equipment.

Other facilities at the company's plant include a 20-inch blooming mill, and 14-inch and 9-inch bar and rod mills; grinding equipment, annealing and pickling and heat treating departments; a wire mill containing 16 draw-blocks and equipped to cold draw stainless steel rods and coils into wire; bridge cranes for the handling and storage of raw materials; and chemical, metallurgical and research laboratories. The addition was designed and construction supervised by the corporation's engineering staff and by H. A. Brassert & Company, of Chicago.

Yearly capacity has been increased to 40,000 tons of stainless steel ingots, and to 12,000 tons of rerolling and forging billets and hot and cold finished bars and wire.

Actual figures on production and sales in the stainless industry have always been shrouded in mystery, and even the most responsible author-

The making of stainless steel requires hand craftsmanship by men long experienced in the industry. Here a veteran steel man rolls bars of stainless in the plant of the Rustless Iron and Steel Corporation in Baltimore.

Pouring stainless—the jewelry item of the steel industry—at the Rustless Iron and Steel Corporation's plant in Baltimore. Three more of these 12-ton electric furnaces have been added during the corporation's $1,500,000 plant expansion.

ities have differed in their estimates. The American Iron and Steel Institute's statistical report gives an estimate of 90,966 tons of ingot production of stainless for last year, while the corresponding estimate of "The Iron Age" is 102,460 tons.

The Rustless plant is the only one exclusively devoted to performing all operations in the conversion of virgin chrome ore and other materials into stainless steel in the form of bars, rods and wire, ready for fabrication into a multiplicity of products for industrial, commercial and consumer use. The corporation employs processes covered by patents or applications for patents which its own experts have developed in recent years.

Since chrome ore must now be brought halfway around the world to Rustless furnaces, a year's supply is constantly maintained at the plant. Principal present sources are in New Caledonia, Southern Rhodesia, Turkey and India.

Earnings of the corporation have progressively increased since the last quarter of 1934. Gross sales totaled $2,162,091 for the first half of 1937. This nearly equals sales for all of 1936, which totaled $2,646,783. Sales for 1935 were $1,675,494, and for 1934 were $819,161.

Capital and capital surplus total $2,363,172, with 848,027 shares of common and 25,000 shares of preferred stock which are owned by 8,500 stockholders. Assets are valued at $3,487,240. There is no funded indebtedness.

Rustless Iron and Steel Corporation was organized in 1924 as International Rustless Iron Corporation. It was then a patent holding company, but in 1926 organized its operating subsidiary, Rustless Iron Corporation of America. The former Hess Steel Company plant at Baltimore, which constitutes the nucleus of its present plant, was acquired the same year. The name Rustless Iron and Steel Corporation was adopted in 1933, at the time of a recapitalization which resulted in converting the corporation's mortgage debt into equity securities. Rustless Iron Corporation of America was dissolved in 1936, its assets being acquired and its liabilities assumed by Rustless Iron and Steel Corporation.

Early activities of the corporation were devoted chiefly to improving its processes and developing its business. The present management took charge in 1931, and beginning with that year new manufacturing processes have been developed by Rustless employees which are covered by patents owned by the corporation.

WORLDS LARGEST BATTERY FOR ELECTRIC TRUCK

▲ THE world's largest battery for electric material-handling has just been built.

It is the Super-type FLM-13 Exide-Ironclad, the first of several of this size to be built by The Electric Storage Battery Company for heavy duty electric industrial truck service.

The Super-type FLM-13 Exide-Ironclad cell has a capacity of 1080 ampere hours at the normal six-hour discharge rate. The complete 16-cell battery, assembled in a steel tray, occupies a space of only 26″ x 51″ and weighs 2½ tons. It has a capacity of 33 K.W.H.—almost twice that of an 18-cell TLM-21 Exide-Ironclad, which is the largest size of this type of battery that could be assembled in the same space.

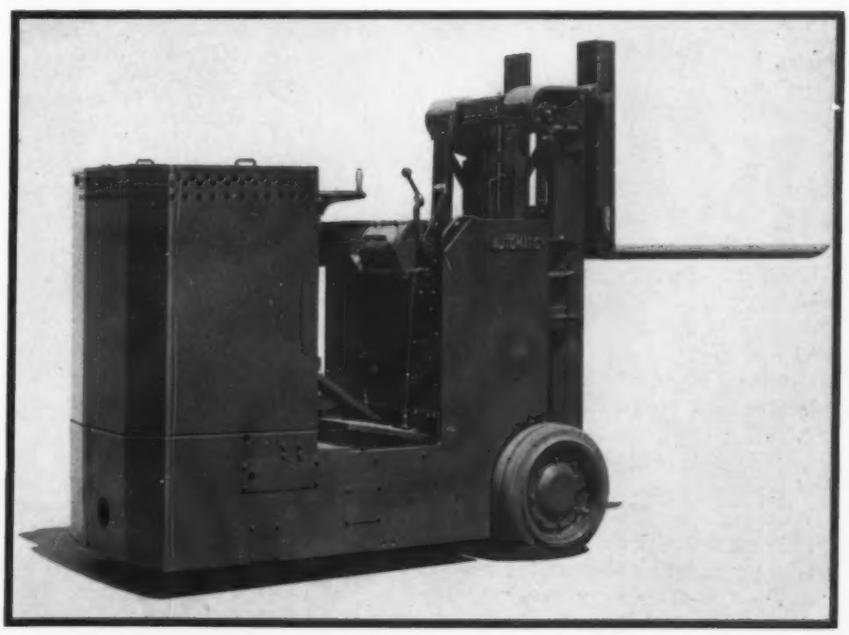
In double-shaft service, the steel tray assembly permits quick exchanges and continuous, dependable service through the use of duplicate batteries, as the steel tray can readily be either rolled or lifted from the truck when one battery is discharged and a freshly charged battery then installed in its place.

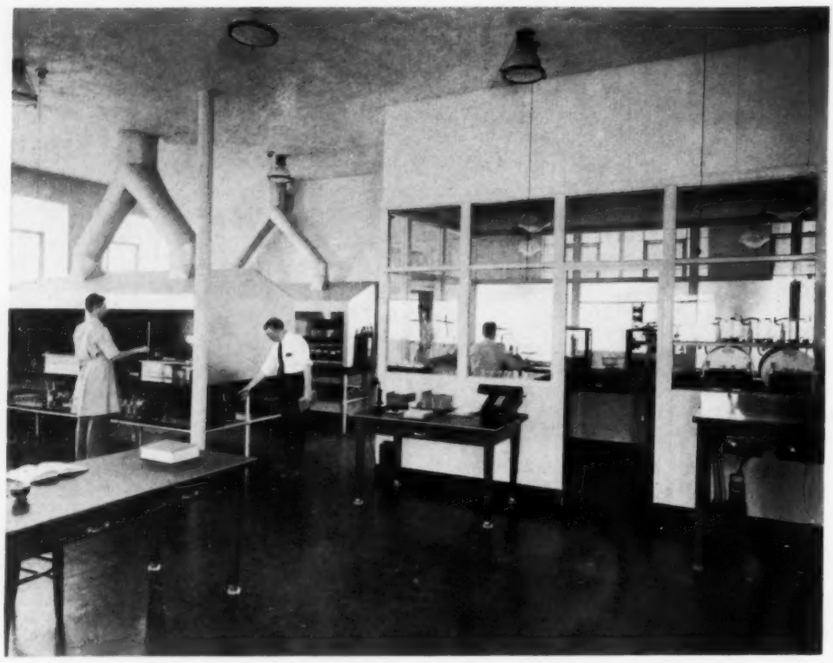
"The Super-type FLM-13 Exide-Ironclad battery has been designed and built for to-morrow's trucks, as well as for the big trucks of today," states Wm. Van C. Brandt, Manager, Motive Power Battery Division, The Electric Storage Battery Company, Philadelphia.

"As material-handling trucks become larger and larger the greater will be the power required to operate them. It was to be expected that Exide, which a half century ago pioneered the storage battery industry, would meet the demand and that our engineers who designed this world's largest battery for industrial trucks would use in it the famous and unique Ironclad principle of plate construction.

" As the demand for larger and more powerful material-handling trucks arises, I feel confident the truck industry will be able to meet it. What the imit wlll be is hard to foresee. But the limit will not be for lack of battery power. For the big trncks of today, as well as those of to-morrow, can be amply powered by the FLM-13 Exide-Ironclad — the world's largest battery for Electric Material Handling Trucks."

Industrial truck equipped with world's largest battery for material-handling.





The new metallurgical and chemical laboratory of the Columbia Steel Co., subsidiary of United States Steel Corporation, at Pittsburg, California.

COLUMBIA STEEL OPENS NEW LABORATORY

▲ THE new metallurgical and chemical laboratory of the Columbia Steel Company, subsidiary of United States Steel Corporation in Pittsburg, California, is perhaps one of the most complete for its size in the steel industry today. Designed by the engineering department at the Pittsburg Works to afford maximum efficiency in technological work, it is equipped with all of the orthodox equipment of a modern metals laboratory, along with facilities for research on methods and products.

In consolidating the activities of scattered laboratories under one roof, the first objective was a compact building in which efficient working conditions would permit every chemist and metallurgist to carry out his tests and experiments with minimum loss of time and effort. Under the direction of G. L. von Planck, chief metallurgist, and Howard Grafton, plant metallurgist of the Pittsburg Works, a staff of 23 men carry on an average of 5,000 determinations and tests per month in the new laboratory.

The two-story structure, with the first story partially imbedded in the ground, is 40 by 80 ft. in plan and has a total available working floor space of 4,864 sq. ft. It is constructed of steel, brick, and concrete, is absolutely fire-proof, and includes many desirable safety features. Acid fumes and heat are removed quickly from the atmosphere by means of an exhaust fan placed on the roof, and the lighting fixtures are of all glass design as a further precaution against corrosive deterioration. All partitions are of steel construction, insulated and soundproof.

The pipe line system in the new laboratory is unique by virtue of the variety of materials used for different lines. All pipe lines are concealed because the basement of the building is used for office and laboratory work. However, sections of the ceiling may be removed to gain access to the lines should it ever become necessary.

Handling of corrosive liquids by hand has been practically eliminated by the use of glass pipe lines. Extra heavy cast iron pipes carry away the waste water except that containing acid solutions which is carried away in pipes of acid-resisting iron. Distilled water is piped through pure tin. Oxygen and vacuum lines are carried to all work benches in copper tubing most of which is concealed by moulding and therefore, readily accessible. Air and gas are piped through welded steel lines which were tested at 100 pounds pressure per sq. in. for a period of three days.

All chemical control work takes place in the main control laboratory at the north end of the main floor where glass encloses a balance room with the latest type of delicate balances, a sample preparation room, and the main work laboratory for routine tests. Adjoining the chemical laboratory is a specially-constructed research room for extraordinary tests on steel products.

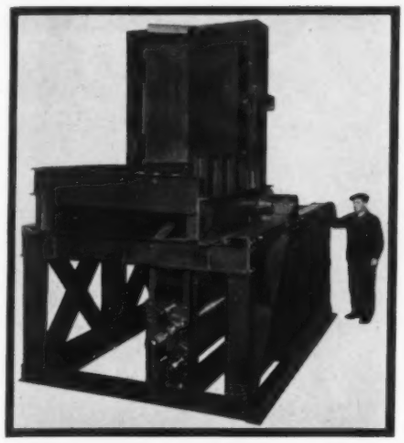
In another room also on the main floor where tin plate is tested for resistance to corrosion, is found the only wood used in the entire building. It forms an insulated wall lining. The balance of the main floor is given over to the offices of the plant metallurgist, laboratory office, observation staff, storeroom, and lavatory.

The lower floor, though located partially below ground level, receives ample daylight for such work as physical testing. The equipment installed here includes a 200,000-lb. Riehle tensile testing machine, two Olsen bending machines, an Erichsen ductility testing machine, a Rockwell machine for testing surface hardness, and machines for testing other physical properties. The metallographic laboratory, which also handles general plant photography, a sample preparation room, and storage vault, and offices for the testing engineer, chief inspector, and observer, are all located on the first floor.

A modern air conditioning system maintains a constant and uniform temperature, supplying warm air in the winter and cool air during the summer. Stainless steel has been used extensively in the installation of laboratory equipment throughout the building.

▲

▲ BLAW-KNOX COMPANY has purchased the assets and business of R. M. Gordon & Company, manufacturers of grease lubricating systems for the steel industry, William P. Witherow, president of Blaw-Knox Company, announced. The activities of the new division will be expanded into additional fields, and the company will be known as the Gordon Lubricator Division of the Blaw-Knox Company, Mr. Witherow concluded.



The combination tilter—combining the functions of down and side-tilting into one compact unit.

COMBINATION TILTER FOR COIL HANDLING

▲ HANDLING coils of steel on ball-bearing roller conveyor is common practice in the new continuous strip and sheet mills. Traveling on end, the coils are carried over a flat roller bed; traveling on side, they are carried in a V-type trough roller bed.

To meet processing and storage requirements, the coils must sometimes be shifted from one of these positions to the other; i. e., they must be down-tilted from a vertical to a horizontal position or up-ended from a horizontal to a vertical position. Another requirement is that the down-tilted coil be discharged over the side of the conveyor, an operation commonly referred to as side-tilting. For example, coils tiered on end in storage often are lifted by traveling crane and deposited on a flat roller conveyor, to be carried over the gravity rolls to an uncoiling machine. The conveyor line here serves two purposes: it provides live storage for a bank of coils ahead of uncoiler, and allows crane to re-stock the line at intervals, releasing it in the meantime for other service. Approaching the uncoiler, the coil is down-tilted to a short storage line of trough rolls and then rolled sidewise off the conveyor line to the coil box. Effecting these changes in position heretofore required two individual power units in the conveyor line: a down-tilter for turning the coil vertically through 90° and a separate side-tilter for discharging the coil to uncoiler. As coils weighing up to 25,000 pounds are handled, the tilting equipment must be of massive construction. Not only the purchase price but also the space occupied and the operating time are important factors in production costs.

Logan Company, Louisville, Ky., has now combined the functions of down and side-tilting into one compact unit—the combination tilter, which costs but little more than a simple down-tilter, requires no more space and no more operating time

The machine illustrated is designed to discharge the coils in the same direction as that from which they are received. The design can be readily altered to discharge from the opposite side. Likewise, on the receiving side, the machine may be designed to receive from either side or from the end. When receiving from the side, the rolls in the receiving bed are skewed in order to guide the coil and seat it snugly against the troughed portion before rotation begins. The far side of receiving bed is provided with a bumper.

The trough portion of the combination tilter is constructed of heavy steel plate, mounted at one side on a longitudinal shaft. Near the comtion of the down-tilting cycle, the troughed plate pivots about this shaft to accomplish the side-tilting. Heavy helical springs hold the trough bed in normal position at all times except when the side-tilting mechanism is functioning.

The general operating cycle is as follows: A brake (usually air-operated escapement type) in the storage conveyor line just ahead of the combination tilter is released to feed a single coil to receiving bed of machine. After coil is in position against the trough plate, now in vertical position, the motor is energized by push button and the down-tilting begins. As the carriage approaches the completion of its 90° movement, a bearing plate on the underside of troughed plate contacts a member on the stationary supporting frame. This causes the troughed plate to tilt laterally by pivoting about its shaft and the coil rolls off at right angles; the carriage then strikes a limit switch and stops. A push button reverses the motor and returns carriage to original position.

The combination tilter illustrated has the screw and crosshead drive, in which the motor is direct connected to screw and no reducer is required. This type of drive insures maximum smoothness of operation and is self-locking in any position. The gear segment type of drive may be furnished if preferred.

The combination principle (patent applied for) may also be used to advantage when it is desired to up-end the coils and discharge them on end at right angles. This arrangement is particularly useful where space is not available for the large radius roller curve that would otherwise be required.

DUST TIGHT VAPOR PROOF LIGHTING UNIT

▲ DESIGNED to provide and sustain maximum light output under severest service and atmospheric conditions, the new Millite lighting units have been announced by the Westinghouse Electric and Manufacturing Company. They are especially suitable for use in steel mills, foundries, cement plants, chemical plants, forge shops and similar heavy industry applications where moisture, smoke, dust, dirt, acid fumes or general hard use preclude the use of ordinary open type high bay units.

The Millite is dust tight and vapor proof which makes it simple to clean and easily maintained. The reflector

Dust tight and vapor proof lighting unit—simple to clean and easy to maintain.

is treated by the Alzak process which retains its high efficiency permanently. There are no louvres or vents to cause a flue action which might deposit a film on the reflector and thus impair the efficiency of the unit.

The complete Millite unit consists of a steel housing, a specular or diffuse removable reflector, and a hinged glass cover. The unit is arranged for ½" conduit mounting but can be furnished for ¾" conduit. They are designed for use with 750 watt, 1000 watt or 1500 watt lamps.

The reflector is spun from No. 14 gauge aluminum sheet. The reflecting surface for medium mounting units is semi-specular finished; for high mounting units specular finished. Both semi-specular and specular reflectors are treated by the Alzak process for higher efficiency and permanence. In addition, the outside surface is finished with special acid-resisting high-bake, multi-coat green enamel.

The mogul skeleton socket is an easy-to-wire type with nickel plated metal parts and large side connected wiring terminals. The socket adapter is cadmium-plated brass, and the socket cap aluminum, finished with special acid-resisting high-bake, multi-coat green enamel.

A one-piece steel housing drawn from No. 20 gauge steel sheet completely encloses the aluminum reflector and protects it from impact damage. The steel housing is finished inside and out with special acid-resisting high-bake, multi-coat green enamel.

The hinged glass cover door consists of a clear lens with a heavy cast aluminum ring complete with gaskets.

The lens is a special, highly-tempered, clear, flat, heat-resisting glass which will withstand severe impacts. If an impact is great enough to destroy the lens, the glass breaks into small rectangular pieces rather than large jagged pieces. The lens will withstand sharp temperature changes without fracture of breakage.

The cast aluminum ring is permanently hinged to the steel housing and locks in place by three, cadmium plated, malleable iron hook bolts. The locking arrangement permits the glass cover door to be opened or closed without the use of any tools. The cast aluminum ring is finished with special acid-resisting high-bake, multi-coat green enamel.

Westinghouse Millites are approved by the National Board of Fire Underwriters as Dust-Tight and Vapor-Proof.

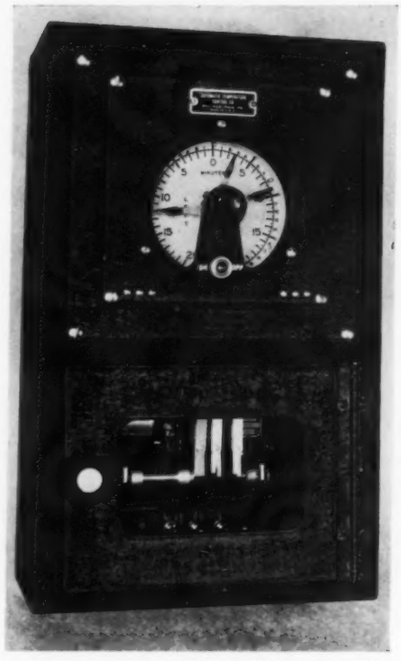
AUTOMATIC TIMER FOR USE ON FURNACES

▲ The new timer shown in the illustration and manufactured by the Automatic Temperature Control Co., Inc., Philadelphia, Pa., is designed to control, on a time basis, the firing of furnaces which are fired at each end, such as soaking pits and open hearths.

On the upper half of the instrument is a dial having two pre-set pointers and one pointer which moves during timing operations. Each fixed pointer is controlled by a separate knob and is set for the desired firing time on the right and left ends of the furnace respectively. In the illustration the right pointer is shown set for 9 minutes and the left for 12 minutes. The maximum range in the instrument shown in this illustration is 20 minutes although this range can be changed to suit conditions. The total firing cycle of the furnace, as set up in the illustration, is the sum of the two pointer readings—21 minutes.

The traveling pointer is shown as it has passed the center position and is moving to the right. On reaching the right fixed hand, it reverses and comes back to 0 in 9 minutes, at which time a contact is made which starts the cam timer shown through the window in the lower half of the case. The moving pointer continues to the left, makes contact with the left fixed hand and comes back to the 0 point in 12 minutes, at which time the contact is again made to start the cam timer and the cycle is continued.

The cam timer shown controls two separate load circuits. Each time contact is made by the moving hand above, the cam timer makes ½ revolution, energizing one or the other load circuit depending upon the direction of motion of the dial hand. Energizing those cam load circuits starts the train of operations necessary to reverse the firing, shutting down the burners on one end, reversing dampers and starting the burners on the opposite end, together with any other operations which may be necessary for the reversal. This cam unit can be arranged to operate each valve or damper directly if desired, and, for this purpose, can be equipped with any required number of load circuits.



Automatic timer designed to control, on a time basis, the firing of furnaces which are fired at each end, such as soaking pits and reheating furnaces.

HEAVY DUTY TYPE LIQUID FUSE

▲ SCHWEITZER & CONRAD, INC., of Chicago have added the extra heavy duty type SM Fuse to their liquid fuse line, expressly for service where very severe short circuits may be encountered. These fuses are suitable for indoor and outdoor service, 200 and 400 ampere ratings for voltages from 5000 to 34,500 volts. The fusible element is built into a re-fill unit and assembled with spring and cable in fuse holder. When a fuse blows, this re-fill unit is replaced. The fuse holder is made of porcelain, easily removed and replaced with a switch-stick for inspection or renewal of re-fill units.

ITEMS OF INTEREST

Wallace L. Cook has been appointed as director of personnel for the Chicago district of the Carnegie-Illinois Steel Corporation.

Mr. Cook is a graduate of Cornell and received his master's degree at Yale. He has been connected with the Carnegie-Illinois industrial relations division since June 1, 1936. Previously he had served on the board of several educational institutions, and had been prominent in industrial relations activities of trade associations. He has taught college courses in mechanics, maintenance, philosophy, government and public speaking. Since coming to Carnegie-Illinois, Mr. Cook has concentrated on coordinating the functions of selection and training of employees for the Chicago district.

▲

Lawrence G. Andrews was made assistant director of personnel for the Carnegie-Illinois Steel Corporation in the Chicago area.

Upon graduating from Ohio State, Mr. Andrews received a scholarship from the bureau of personnel research at Carnegie Institute of Technology. From 1921 to 1926 he served as an assistant employment manager for Jones and Laughlin Steel Corporation at Aliquippa, Pennsylvania, and in 1926 entered the personnel department of Armour and Company. He has been assistant superintendent of industrial relations at South Works of Carnegie-Illinois Steel Corporation since January 1936.

▲

H. L. Brindle has been given the title of General Superintendent of Edgar Thomson Works, Carnegie-Illinois Steel Corp., Braddock, Pa. Mr. Brindle was placed in charge of this plant recently, when Frank F. Slick was granted an indefinite leave of absence. He went from Youngstown to Edgar Thomson on September 1, under the title of Acting General Superintendent.

▲

George H. Bendell has been named superintendent of the American Steel & Wire Company plant at Waukegan, Illinois. He succeeds the late W. E. Acomb. S. R. Snow, foreman of the wire mill, has been promoted to assistant superintendent replacing Mr. Bendell. Mr. Bendell has been with the United States Steel Corporation since 1907, beginning as an inspection clerk with the former Illinois Steel Company.

▲

C. Clarke Wales, former chief engineer of the Otis Steel Company, is now located with the Algoma Steel Corporation, Ltd., of Sault Ste. Marie, Ontario, Canada. Mr. T. F. Rahilly of the Algoma Steel Corporation announced that Mr. Wales will be the Assistant General Manager.

C. CLARKE WALES

After graduating from the University of Toronto in mechanical engineering, Mr. Wales joined the Westinghouse Electric and Manufacturing Company in East Pittsburgh, Pennsylvania.

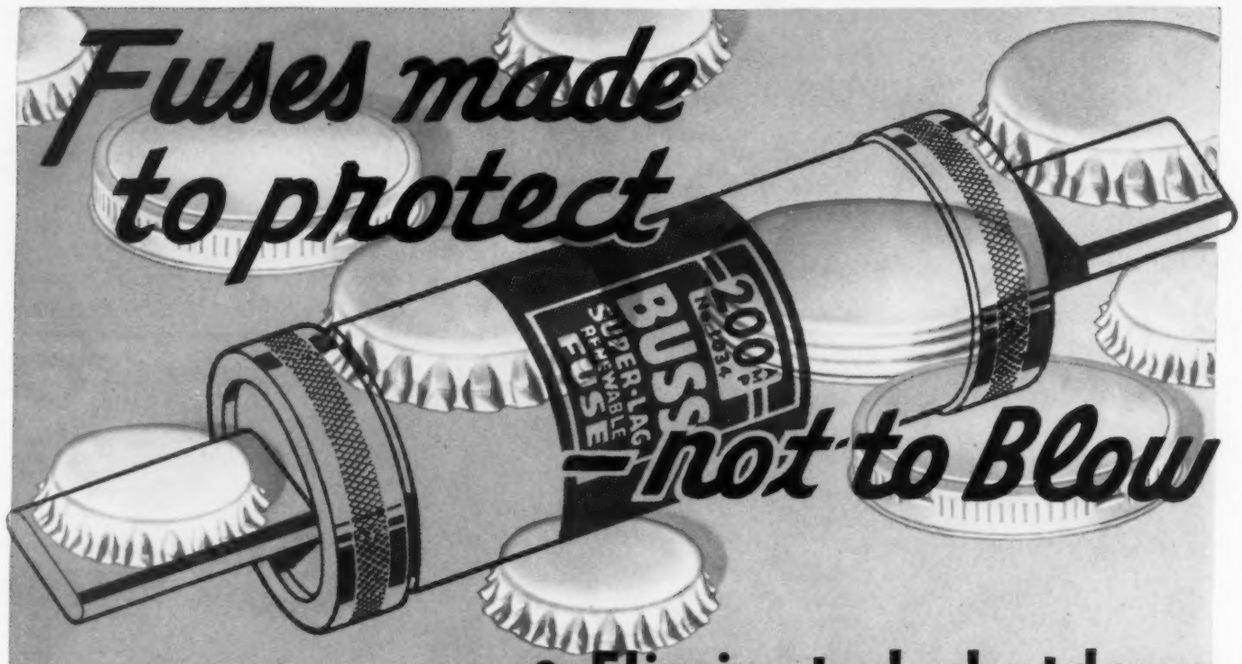
(Continued on page 47)

WALLACE L. COOK

LAWRENCE G. ANDREWS

HARRY L. BRINDLE

Fuses made to protect — not to Blow



• Eliminated shutdown worries on Compressor Motor Circuit for CROWN CORK & SEAL COMPANY

Details by Mr. Wm. Cooper, Ch. E. E. of Baltimore plant.

"300 ampere fuses used to protect our compressor motor circuit were blowing much too frequently. After an investigation, we decided that if the claims made for BUSS Super-Lag Fuses were correct, we should be able to use fuses of the 200 ampere size and eliminate these needless blows—and at the same time get better protection.

Six weeks ago we installed 200 ampere BUSS Fuses—to date they have not blown once".

BUSS *Super*

ADVERTISING PAGES REMOVED

In 1925 he became assistant chief metallurgist of the Otis Steel Company and later, superintendent of the open hearth, blooming mill and bar mills.

In 1929, Mr. Wales became chief engineer of the same company, in which position he supervised the planning and construction of their 72″ hot and cold strip mills. Mr. Wales was recently elected as first vice president of the Association of Iron and Steel Engineers.

▲

Ray Fenton has been named chief engineer for the Otis Steel Company, succeeding C. Clarke Wales. He formerly had been manager of the sheet, tin and strip division of Aetna-Standard Engineering Company, Youngstown, Ohio, and before that was chief engineer for Newton Steel Company.

▲

Herbert V. Thaden was appointed as sales engineer in the Stainless Steel Division of the Carnegie-Illinois Steel Corporation, Pittsburgh, Pennsylvania.

Mr. Thaden, an aeronautical engineer with a long and comprehensive experience in the design, manufacture and operation of lighter- and heavier-than-air craft, will devote his efforts to the technical and business development of stainless steel products for aircraft use. His headquarters will be in the general offices of the company here.

For the past few years Mr. Thaden has been engaged in aviation sales work and specializing as a consultant on the economics of aircraft manufacture and operation. He had previously been an executive in General Aviation Corporation and in his own all-metal airplane manufacturing establishments.

He holds the rank of Major in the Air Corps Reserve and is an active pilot of military and commercial aircraft.

▲

W. Cordes Snyder, Jr., at a meeting of the Board of Directors, was elected president of the Lewis Foundry and Machine Company, a Blaw-Knox Company subsidiary. Mr. Snyder has been associated with the company for a number of years and was elected vice president in 1936. His election as president fills a vacancy which has existed during the past year.

▲

Walter J. Worth has been appointed sales representative for the Pittsburgh Rolls Corporation, a subsidiary of the Blaw-Knox Company at Pittsburgh. After studying at Carnegie Institute of Technology, Mr. Worth became connected with the Duquesne Steel Foundry Company and later with the Continental Roll and Steel Foundry Company, spending six years on shop work and 15 years in the sales organization.

▲

Roland S. Higgins has been appointed as representative of the middlewestern district of the Continental Roll and Steel Foundry Company, with offices at East Chicago, Indiana. His duties will be in connection with the sales and engineering of Universal Industrial Gas Burners and allied combustion and furnace equipment manufactured by this division of the company.

During the past fifteen years Mr. Higgins has been actively engaged in combustion engineering and the sale of combustion and control equipment. He was recently with the Smoot Engineering division of the Republic Flow Meters Company.

▲

H. R. Gravenstreter, formerly master mechanic of the Shenango Works of Carnegie-Illinois Steel Corporation, New Castle, Pennsylvania, has been appointed as assistant to the general superintendent of the same plant.

Mr. Gravenstreter graduated from the Case School of Applied Science as an electrical engineer. He has been associated with subsidiary companies of the United States Steel Corporation, since 1917.

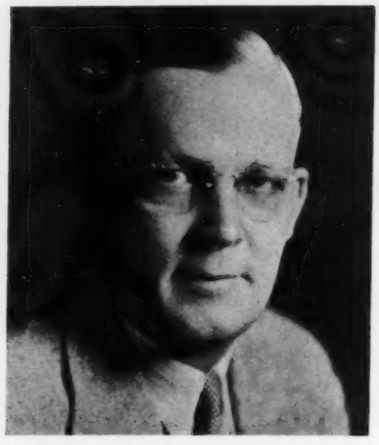
HERBERT V. THAYDEN

W. CORDES SNYDER, JR.

WALTER J. WORTH

ALFRED H. WERNER

JOHN H. ELLIOTT



HARRY C. FORD

Alfred H. Werner was made the superintendent of the hot strip mill, Irvin Works, Carnegie-Illinois Steel Corporation, Pittsburgh, Pennsylvania. Mr. Werner, formerly foreman at the 43-inch strip mill of the McDonald, Ohio, Works, has steel plant, railroad and engineering experience dating from 1914, when he entered the steel industry as a tallyman.

▲

John H. Elliott was recently appointed as tin finishing superintendent at the Carnegie-Illinois Steel Corporation's new Irvin Works, near Pittsburgh, Pennsylvania. Mr. Elliott, formerly assistant general superintendent of Shenango Works, New Castle, Pennsylvania, has been associated with the subsidiary companies of United States Steel Corporation since 1919, when he entered the Shenango Works in the steam engineering department. He served successively as combustion engineer, annealing foreman, assistant master mechanic and assistant general superintendent.

▲

Harry C. Ford has been appointed superintendent of the production and shipping departments. Mr. Ford goes to the Irvin Works from New Castle Works, where since 1936 he was assistant to the general superintendent. He began his career in 1903 as an assorter in the Cambridge, Ohio plant of the former American Sheet and Tin Plate Company, and subsequently was order clerk for the tin company at Dover, Ohio, and Farrell, Pennsylvania, before going to New Castle.

▲

B. E. Pheneger, for the past two years Superintendent of Central Furnaces and Docks of the American Steel & Wire Co., U. S. Steel Corpn. subsiduary, has been appointed General Superintendent of both Central Furnaces and the Cleveland Coke Works. H. F. Dobscha has been made Superintendent of Central Furnaces, while W. R. Pendry continues as Superintendent of the Coke Works.

Mr. Pheneger's service with the company dates back to September, 1907, when he started as a Draftsman at Central Furnaces.

Born in Cleveland, Mr. Pheneger was educated in that city's schools and was graduated from Case School of Applied Science with a Civil Engineering degree.

Mr. Dobscha started with the Wire Company in March, 1918. He has been Assistant Superintendent at Central Furnaces and Docks since January, 1936.

▲

J. R. Thompson has been appointed Assistant Manager of the American Steel & Wire Company, Metallurgical Department at Cleveland; L. H. Dunham has been made District Metallurgist of the Chicago district; R. H. Barnes takes a similar post in Cleveland and R. R. Leo has been appointed Assistant Division Metallurgist at Cleveland.

Mr. Thompson is well-known in the metallurgical field, having done some exceptional work, particularly in the development of special types of wire. He has worked for the American Steel & Wire Co. since 1901, starting as an assistant in the laboratory at the Newburgh Steel Works and working his way up to successive positions as Chief Chemist at Central Furnaces, District Metallurgist in the Cleveland district and Division Metallurgist for the company, which position he has held until his present appointment.

Mr. Dunham has been with the company for twenty-one years, having been District Metallurgist in the Cleveland district since the early part of this year. Mr. Barnes has had seventeen years' service with the company and is moved up from Assistant District Metallurgist. Mr. Leo has been with the company since early in 1935 and for the past year has been serving the bolt trade in the Cleveland district.

▲

Robert Bischoff, hydraulic engineer, has been placed in charge of all valve engineering for Koppers Company's Western Gas Division, Fort Wayne, Ind.

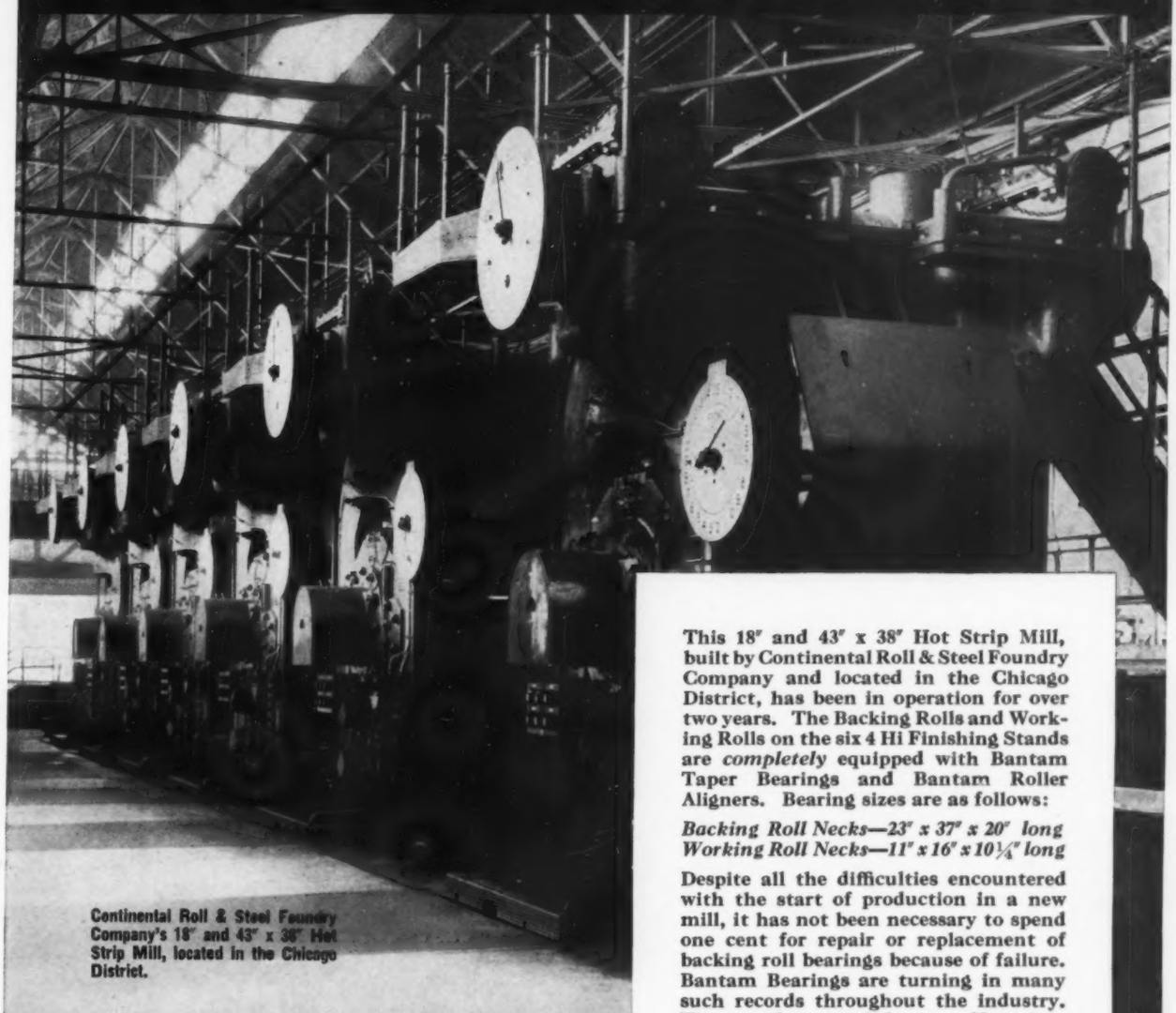
This division manufactures hydraulic gates and special valves, as well as gate valves for water works, sewage plants, and the steel, chemical and processing industries.

Mr. Bischoff formerly was associated with the manufacture of hydraulic turbines in Switzerland.

TWO YEARS OF OPERATION

Not One Cent Spent

ON BACKING ROLL BEARINGS



Continental Roll & Steel Foundry Company's 18" and 43" x 38" Hot Strip Mill, located in the Chicago District.

This 18" and 43" x 38" Hot Strip Mill, built by Continental Roll & Steel Foundry Company and located in the Chicago District, has been in operation for over two years. The Backing Rolls and Working Rolls on the six 4 Hi Finishing Stands are *completely* equipped with Bantam Taper Bearings and Bantam Roller Aligners. Bearing sizes are as follows:

Backing Roll Necks—23" x 37" x 20" long
Working Roll Necks—11" x 16" x 10¼" long

Despite all the difficulties encountered with the start of production in a new mill, it has not been necessary to spend one cent for repair or replacement of backing roll bearings because of failure. Bantam Bearings are turning in many such records throughout the industry. They can do as much for you. Next time specify Bantam.

BANTAM BEARINGS CORPORATION
SOUTH BEND - - - INDIANA
Subsidiary of
THE TORRINGTON CO.,
Torrington, Conn.

BANTAM
BEARINGS

TAPERED ROLLER • • • STRAIGHT ROLLER • • • BALL BEARINGS

ELMER F. WEISS

A. R. JOHNSON

Elmer F. Weiss has been appointed manager of the Detroit office of Cutler-Hammer, Inc., located at 2755 E. Grand Boulevard, Detroit, Michigan. Mr. Weiss succeeds A. R. Johnson, who has recently been appointed manager of the company's Merchandising Sales Division.

Mr. Weiss' wide experience in all phases of motor control applications makes him particularly well qualified for his new position. Mr. Weiss began his career with Cutler-Hammer immediately upon his graduation from Carnegie Institute of Technology in 1922. Since that time he has served in the engineering department of Milwaukee headquarters, in the sales department of the Chicago Office, and since 1928 has played an important parts in the sales activity of the Detroit territory.

Mr. Weiss is a member of the Association of Iron and Steel Engineers and an authority on control equipment for the steel industry.

▲

A. R. Johnson was recently appointed as manager of the merchandising sales division in charge of distributor sales of the Cutler-Hammer, Inc. Mr. Johnson will be located at the headquarters of the company in Milwaukee, Wisconsin.

Formerly manager of Cutler-Hammer's Detroit office, Mr. Johnson brings to his new position an extensive and invaluable experience in the sale of the company's complete line.

Mr. Johnson joined the Cutler-Hammer organization in 1917 as a member of the sales department. In 1924 he was transferred to the company's Chicago office, and in 1928 moved to Detroit as manager of that sales office.

▲

M. H. Lebowitz was made chief inspector of Wood Works, Stainless Steel Plant, Carnegie-Illinois Steel Corporation, McKeesport, Pennsylvania.

Mr. Lebowitz, who has been employed by the company for fourteen years, formerly was foreman of the finishing department. George W. Douglas, foreman of the warehouse and shipping department, will assume Mr. Lebowitz's former duties in addition to his own.

▲

Latimer Kovarik was appointed in charge of the Pittsburgh territory of the Salem Engineering Company. Mr. Kovarik's address is 408 South Graham Street, Pittsburgh, Pennsylvania.

▲

Presley Hamilton was named as the New York district representative of the Salem Engineering Company of Salem, Ohio. Mr. Hamilton's headquarters will be at 149 Broadway, New York, New York.

▲

H. McE. Patton, formerly located with the Pittsburgh Steel Company, has joined the staff of Research and Development Division of the Jones & Laughlin Steel Corporation, Pittsburgh, Pennsylvania.

▲

Died

Max A. Berg, aged 69, at his home in Chicago, Illinois, on July 16. Long a prominent factor in the electric railway and power fields, Mr. Berg had served as vice-president and secretary of the Electric Service Supplies Company since it was founded in 1906.

Mr. Berg started his electrical career in 1886 with the Electric Supply Company of Chicago, and later, in 1892, served as manager of the Electric Railway Department of the Ansonia Electric Company, Chicago. His next connection was with the Ohio Brass Company of Mansfield, Ohio. In 1902 he became a member of the firm of McGill-Porter & Berg, which partnership later became Porter & Berg Company, and in 1906 this company merged with others to form the Electric Service Supplies Company, with which Mr. Berg was connected for the past thirty-one years.